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POLLUTION OF INTERSTATE WATERS LOWER COLUMBIA RIVER, BONNEVILLE DAM TO CATHLAMET, WASHINGTON. HELD AT PORTLAND, OREGON ON 10-11 SEPTEMBER 1958. TRANSCRIPT OF CONFERENCE

Public Health Service
Washington, D. C.

September 1958

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TRANSCRIPT OF CONFERENCE
IN THE MATTER OF

POLLUTION OF INTERSTATE WATERS
LOWER COLUMBIA RIVER
BONNEVILLE DAM TO CATHLAMET, WASHINGTON

september 10-11, 1958
portland, oregon

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CONFERENCE ON POLLUTION OF INTERSTATE WATERS

LOWER COLUMBIA RIVER
(Below Bonneville Dam)

Auditorium, Interior Building
Portland, Oregon
September 10 and 11, 1958.

CHAIRMAN -- MURRAY STEIN, Chief
Interstate Enforcement
Water Supply and Water Pollution
Control Program
U. S. Public Health Service
Washington, D.C.

CONFEREES:-
HAROLD E. MILLER, Director
Washington Pollution Control Commission
Olympia, Washington

CURTISS M. EVERTS, JR., Secretary
Oregon State Sanitary Authority
Portland, Oregon

RICHARD F. POSTON, Assistant Regional Engineer
U. S. Public Health Service
Region IX
San Francisco, California.

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(A list of other attendees is attached as "Appendix A")

...Whereupon, the Conference was convened at 9 o'clock, a.m., Wednesday, September 10, 1958, by Chairman Stein...

CHAIRMAN STEIN: The conference is open.

This conference in the matter of pollution of the interstate waters of the lower Columbia River from Bonneville Dam to its mouth, involving the States of Washington and Oregon, is being held under the provisions of Section 8 of the Federal Water Pollution Control Act. Under the terms of the Act, the Surgeon General of the Public Health Service is required to call a conference of this type when requested to do so by the Governor of any State, or a State Water Pollution Control agency, or when, on the basis of reports, surveys and studies, he has reason to believe that pollution subject to abatement under the Act is occurring.

We have been in receipt of letters from the Governor of Oregon and the representative of the State Water Pollution Control agency of Washington, which, we believe, ask for a conference under Section 8. Evidently, there was some misunderstanding on the matter, and, if this is not the case, I would like to read this telegram to me, dated September 9th, into the record. It says:

"Relative to my letter of May 1, 1958, to the Honorable Marion B. Folsom, requesting the entrance of the Department of Health, Education and Welfare into the pollution control problem on the Columbia River between the States of Oregon and Washington. I wish to commend you for the hearing you have called for today, September 10. I would like to make it clear that I sought your services under Section 2 of Public Law 660 of the Federal Water Pollution Control Act, and not Section 8. I know that Oregon and Washington jointly are making considerable progress in this matter and have hopes that your agency might be of assistance to them."

That is signed by Robert D. Holmes, Governor.

Now, there may have been the same intention, I am so informed, on the part of the State of Washington in requesting this conference. However, under our law there is no procedure for the calling of a conference under Section 2. In the operation of that section, which has been in effect since 1948, numerous comprehensive programs have been developed, but conferences have not been called. The only time that "conference" is mentioned in the law is in connection with Section 8, dealing with enforcement measures on pollution. In that way, I assume this misunderstanding arose.

However, under the law, the Surgeon General may also call this conference when, on the basis of reports, surveys and studies, he has reason to believe that pollution subject to abatement under the Federal Water Pollution Control Act is occurring.

The Public Health Service has kept this area, as well as other interstate areas, under surveillance, and it has collected reports, analyzed reports, surveys and studies in these areas. On the basis of this information, the Surgeon General has reason to believe that pollution in the interstate waters of the Columbia River is occurring, and he called the conference under that section of the law too. So, I think this conference was called under both sections of the law, and, in response to the directive of the Surgeon General, we will proceed on the basis that this conference was called under Section 8 of the Water Pollution Control Act.

The purpose of the conference, and here we fully agree with the sentiments expressed by the Governor of Oregon in his telegram, is to bring together State and local water pollution control agencies, and the Public Health Service, and other interested parties, to review the existing situation, the progress which has been made, and to lay a basis for future action by all parties conferring, and to give the States, localities and industries an opportunity to take any remedial action which may be indicated under State and local law.

The conference technique is rather an old one. As a matter of fact, it is used by many State agencies informally in the normal conduct of their business in the field of water pollution control. The notion of a conference was proposed by the United States Supreme Court in the famous case of New York and New Jersey involving interstate pollution. The court said, as far back as 1921, and I quote:

"We can not withhold the suggestions inspired by the consideration of this case that the grave problem of sewage disposal presented by the large and growing populations living on the shores of New York Bay is one more likely to be wisely solved by cooperative study and by conference and mutual concession on the part of representatives of the states so vitally interested in it than by proceedings in any court, however constituted."

This, we think, is particularly applicable to the relatively complex situation such as we have in the lower Columbia River.

Under Section 8 of the Federal Act, the Surgeon General has notified the official State water pollution control agencies of this conference. These agencies are the Washington State

Pollution Control Commission and the Oregon State Board of Health. Under the law, this is a conference between these official agencies and the Public Health Service. The official agencies are privileged to bring whomever they wish to the conference and have them participate in the conference.

The conferees have been designated by these official agencies. For Washington, the conferee is Harold E. Miller, Director of the State Pollution Control Commission. For Oregon, the conferee is Curtiss M. Everts, Jr., Director of Division of Sanitation Engineering of the State Board of Health; for the Public Health Service, Mr. Richard F. Poston, Assistant Regional Director, Region IX, with headquarters in San Francisco. My name is Murray Stein. I'm from headquarters, Public Health Service, Washington, D.C.

Both the States and the Federal Government have responsibilities in dealing with interstate pollution control problems. The Federal Water Pollution Control Act declares that the States have primary rights and responsibilities in taking action to abate and control interstate pollution. It has always been the policy of the Public Health Service to recognize this traditional role of the States. The function of the Public Health Service is to encourage the States in these activities. However, the Public Health Service is charged by the law with specific responsibility in connection with interstate pollution problems.

The Federal Water Pollution Control Act provides that pollution of interstate waters, which endangers the health or welfare of persons in the State other than that in which the pollution originates, is subject to abatement.

The conference will be useful in providing a clear record delineating the progress which has already been accomplished, and indicating what still needs to be done in correcting any interstate pollution problem which may exist.

Under the Federal law, the Surgeon General is required at the conclusion of the conference to prepare a summary of the conference, which will be sent to all the conferees. The summary, according to law, must include the following:

(1) Occurrence of pollution of interstate waters subject to abatement under the Federal Act.

(2) The adequacy of measures taken toward abatement of pollution; and

(3) The nature of delays, if any, being encountered in the abatement of pollution.

It is suggested that the conference discussions be directed toward these points so that we may prepare a serviceable summary at its conclusion. In addition, the law requires the Surgeon General to determine at the conclusion of the conference whether effective progress toward abatement of pollution, if such pollution exists, is being made.

To aid the Surgeon General in this determination, the conference material and reports, I am sure, will be most useful.

Now, very often, conferences have taken two courses, and this assumes, of course, that the basic assumption is that a determination is made that pollution subject to abatement under the Federal Act exists, and that the Federal Government has jurisdiction in the case. If that is so, generally the conferees have come up with two solutions. One is, when considerable progress and consultation has been already taken in the area, pretty definitive conclusions are reached at the conference, and, in almost all cases, a time schedule for remedial action is agreed on by the conferees.

When such is not the case, the conferees sometimes declare a session of the conference, such as this, to be the first session of the conference, and then at a future date decide to hold a second session of the conference where more definitive conclusions may be reached. In the interim between the first and second sessions of the conference, of course, appropriate work can be done by the State agencies and the Federal Government to come to conclusions or gather information which will be helpful in arriving at the definitive determination. At the present stage, of course, we can't know how this conference will come out.

Now, a word about the procedures governing the conduct of the conference. Mr. Montgomery is making a stenographic report of these proceedings for the purpose of aiding us in preparing a summary and also providing a record of what is said and done here. We will make copies of the summary and of the conference and this transcript available to the conferees. Other people desiring to receive copies of the transcript and the summary should get in touch with their official State water pollution control agencies, who are represented at the conference here, and request such copy.

An agenda has been provided for the conference. The agenda is to aid us in directing our discussions toward the points required to be covered by law. However, the agenda can be adjusted to meet particular situations as they arise.

All the conferees will be called upon to make statements. The conferees, in addition, may call upon the participants they have invited to the conference to make statements. At the conclusion of such statements, the conferees will be given an opportunity to comment or ask questions, and, at the conclusion of the conferees comments and questions, I may ask some questions too. This procedure has proved effective in developing a clear statement of the problems and of reaching solutions, reaching agreements on equitable solutions where such solutions were called for.

Now, I would like to call upon Mr. Poston of the Public Health Service to give a statement on the general aspects of pollution in the lower Columbia River. Mr. Poston.

MR. POSTON: Mr. Stein, fellow conferees. Water has often been described as the life blood of our community and one of our most important resources. Domestic water delivered to the home is the cheapest commercial commodity known. Without abundant water, we have deserts in place of prosperous agriculture. Without abundant water, the basic industries, which make our country great, would not be possible.

As the people in the Pacific northwest well know, water provides cheap hydro power and superlative recreational facilities. These facts are well known. Another fact, equally important and often overlooked, is that quality of water may be as important as quantity. High quality water has universal uses. Lower quality water has more limited uses.

Because of the national importance of water quality and the responsibility imposed by the Congress on the Public Health Service, we have a direct concern in the condition of the nation's interstate waters, and we keep surveillance thereon. The lower Columbia is just one of the interstate situations.

Our knowledge of interstate pollution has been gained through the gradual compilation and analysis of existing information. This information comes from a variety of sources, surveys, reports, news clippings, personal interviews, and so forth. The Public Health Service is backstopped by the largest and most diversified, most competent group of water pollution experts, I think. I'm referring now to the Sanitary Engineering Center of Cincinnati, Ohio.

In cases, such as the preparation for today's conference, we call upon these experts to evaluate the materials that we have collected in detail, to bring our knowledge up to date, to provide us with objective views. Mr. Francis Kittrell, in charge of Stream Sanitation of the Sanitary Engineering Center, has made an evaluation and report on pollution of interstate waters of the lower Columbia, and I would like now to call upon Mr. Kittrell to give us a summary of his report, which will be the Public Health Service's contribution to a better understanding of the situation that we face today.

Mr. Kittrell.

CHAIRMAN STEIN: Mr. Kittrell, may I ask you and the other parties who are to make statements to come up to the lectern here and use it to make their statements.

MR. KITTRELL: Mr. Chairman, conferees, ladies and gentlemen:

The Columbia River is the second largest stream in our country. It rises in British Columbia and enters Washington near the northeastern corner of the State. The river flows in a generally southerly direction across Washington to Oregon. Here it turns west and serves as the boundary between Washington and Oregon as it flows to the Pacific Ocean. The total distance traveled is 1,200 miles through a drainage area of 259,000 square miles. From this large area, the river at its mouth discharges an annual average of nearly 200,000 cubic feet per second.

This statement deals with a 104 mile section of the lower Columbia River between Bonneville Dam and Cathlamet, Washington. The facts used here are taken from a "Report on Pollution of Interstate Waters of the Lower Columbia River, Bonneville Dam to Cathlamet, Washington", published by the United States Public Health Service in August, 1958. At this point, I wish to place a copy of that report in the record of this conference.

CHAIRMAN STEIN: That will be marked Government's Exhibit No. 1.

...Whereupon, the document referred to was marked Government's Exhibit No. 1, and such document accompanies the original transcript of the conference...

MR. KITTRELL: The reach of river involved is the most highly developed section of the entire main river, with nearly a half million persons living along its banks. Of these, 436,000 live in the three major cities on the river, Portland, Vancouver, and Longview. Portland is by far the largest center of population, with 374,000 persons.

Numerous industries are situated on or near the banks of this section of the river. The principal production of these industries are electrometallurgical products, processed foods, and wood products, including pulp and paper.

The lower Columbia River is used for nearly every purpose that a river can serve.

At Bonneville Dam, the river produces power through ten Kaplan turbine-generator units, having a total rated capacity of approximately 518,400 kilowatts. These units furnish an important portion of the total hydro power produced in the Columbia River Basin. The dam is equipped with a navigation lock having a minimum 27 foot depth. Facilities are provided which permit anadromous fishes to pass upstream to spawn and fingerlings to pass downstream to the sea.

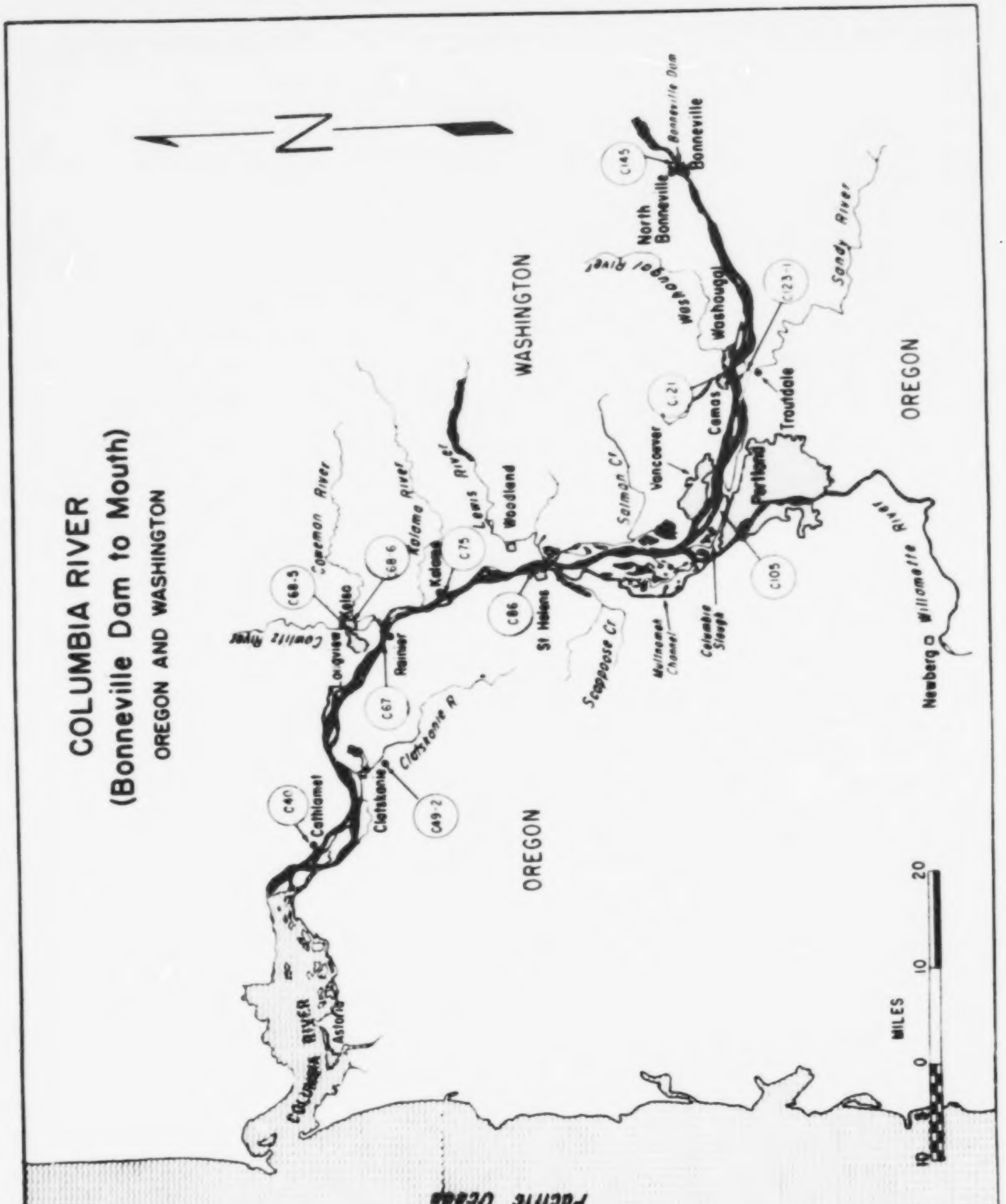
At Longview, Washington, the river serves as the source of water supply for the Weyerhaeuser Timber Company pulp and paper plant. A portion of this 85 million gallon per day industrial supply is used for domestic purposes by the plant's 1,000 employees.

The Longview Fibre Company pulp and paper mill, also at Longview, uses 35 million gallons of river water daily. The water is taken from the Cowlitz River near its mouth, but, under certain tidal conditions, Columbia River water enters the plant intake.

A few other small industrial water supplies are taken from the Columbia.

The river provides many forms of recreation for many persons. The scenic beauty of the river and bordering areas attracts many tourists to its banks.

Numerous boat moorages along both sides of the Columbia River from Camas to Longview attest to the popularity of the river for pleasure boating. There are about 2,500 licensed boats of 16 feet or longer on the lower Columbia. The Coast Guard estimates that there are at least 10,000 unlicensed smaller boats on the river. Some of the estimated 12,500 craft are commercial, but pleasure boats constitute the majority. Many of the pleasure boats are used in connection with the increasingly popular sport of water skiing.



COLUMBIA RIVER
(Bonneville Dam to Mouth)
OREGON AND WASHINGTON

N
WASHINGTON
OREGON
OREGON
Pacific Ocean
COLUMBIA RIVER
Astoria
C40
Cathlamet
Clatskanie
C49-2
Clatskanie R
C67
Rainier
Longview
Kelso
C68.5
C68.6
Cowlitz River
Coweman River
Kalama River
Kalama
C75
Lewis River
Woodland
C86
St Helens
Scappoose Cr
Salmon Cr
Multnomah Channel
Columbia Slough
C105
Portland
Vancouver
Camas
C21
Troutdale
C123-1
Washougal
Washougal River
North Bonneville
C145
Bonneville
Bonneville Dam
Sandy River
Willamette River
Newberg
MILES
10
0
10
20

Most of the organized swimming on the river is at Reeder Beach on Sauvie Island, at Jantzen Beach on Hayden Island, and from the Portland-Vancouver area upstream to Government Island. In addition, there is unorganized swimming by individuals and small groups at various points throughout the entire reach of the Columbia under consideration.

Sport fishing is extremely popular on the lower Columbia. The salmon and steelhead trout of the river are highly prized by anglers. A cooperative creel census by Washington and Oregon fisheries representatives indicated that over 54,000 salmon, weighing about 700,000 pounds, were taken from the lower river by sport fishermen between July 15 and September 2, 1957. It is estimated that the fishermen spent about $2,000,000 for this sport.

A creel census was taken at one of 25 to 30 favorite steelhead fishing spots during a recent summer season. About 2,800 steelhead trout were taken at the one spot during the season. If the steelhead catches were similar at the other spots, it would indicate a total catch of about 75,000 trout for the season. Data on cost of the catch to the sportsmen are not available, but pound for pound the sports fisherman spends about 50 per cent more for steelhead trout than for salmon.

Duck hunting is popular on the lower Columbia River. Use of boats is an important feature of this sport. Available data do not permit an exact definition of the value of this activity. The data that are available indicate that about 10,000 hunters bagged about 90,000 ducks at a cost of over $400,000 during the 1956-1957 season.

There is a small amount of trapping on the lower Columbia. Available data indicate that something like 7,500 muskrat pelts, worth more than $8,500, were taken during the 1956-1957 season. The small total income from this use of the river indicates that the trapping probably is more of a recreational hobby than a commercial venture.

Although Portland is over 100 miles from the ocean, the Columbia makes it one of the important ports of the Pacific Coast. Both ocean-going liners and naval warships dock at Portland. During 1956, nearly 22,400,000 tons of cargo, equivalent to nearly 1.5 billion ton miles of haulage, moved between the Portland - Vancouver area and the mouth of the Columbia.

Large numbers of log rafts are transported on the river to supply the lumber and pulp and paper plants in this area. While awaiting use, the logs are stored in quiet areas along the river banks and in sloughs on both sides of the river.

The lower Columbia River is used for a small amount of irrigation. Water is pumped from the river for this purpose at 25 to 30 points between Bonneville Dam and Cathlamet. The water is used principally on vegetable produce, such as celery, strawberries and beans.

The Columbia River commercial fishery has been estimated to yield an annual return of $20,000,000 in recent years.

The importance of the fishery is indicated by the estimated $50,000,000 spent for its protection by State and Federal agencies during the past ten years.

Not all of the $20,000,000 annual return accrues to the lower Columbia, but an important portion does. In 1957, about 800 gill net fishermen earned an estimated $4,000,000 on the lower Columbia River. More than 6,000,000 pounds of salmon and steelhead were canned, and nearly 3,000,000 pounds were processed as frozen fish. The total value of the canned and frozen fish was about $8,000,000.

The commercial fishermen are estimated to have nearly $3,000,000 invested in boats, gear, and other equipment. They spend about $6,600 per year for maintenance of the 78 fishing drifts between Bonneville Dam and Cathlamet.

Finally, the river receives and carries away the sewage and industrial wastes from the municipalities and industries along its banks. This use of the river, unfortunately, results in pollution of these interstate waters that endangers the health and welfare of some of the inhabitants of both States.

The constituents of wastes that cause pollution of the lower Columbia River may be divided into two general categories. One includes the bacteria and other microorganisms from sewage which cause hazards to health. The other category includes those organic compounds from both sewage and certain industrial wastes that act as nutrients which support excessive growths of non-pathogenic bacterial slimes. These slimes lower water quality in the lower Columbia and interfere with fishing. The dominant slimes have been identified as Sphaerotilus.

There are 21 sewerage systems in communities and industrial plants which discharge sewage to the Columbia River between Bonneville Dam and Cathlamet. Of these, the towns of Rainier and St. Helens, Oregon, and Cathlamet, Washington, provide no sewage treatment. These towns have a total population of about 6,400 connected to their sewerage systems. In addition, the sewage from about 700 persons in Vancouver, Washington, receives no treatment.

The other 18 sewerage systems include a minimum of primary treatment. Of these, all on the Washington side include chlorination in addition to primary treatment. On the Oregon side, two systems include primary treatment followed by chlorination, one has intermediate treatment and chlorination, and one has secondary treatment. Only one town, Portland, and one industrial plant, Reynolds Aluminum Company, provide primary treatment only.

The combined effect of sewage treatment at all Washington sources is to reduce the coliform organisms, or sewage bacteria, contained in the raw sewage by an estimated 88.5 per cent before discharge to the Columbia River. The comparable overall reduction at all Oregon sources is estimated to be only 50.1 per cent.

It is estimated that the coliform organism content of the sewage discharged to the lower Columbia from all sources is equivalent to the coliform organism content of raw sewage from a sewered population of about 156,000 persons. This represents a combined reduction of nearly 59 per cent of the coliform organisms in the raw sewage from the total sewered population of about 377,800 people.

...Whereupon, Chart 1 was displayed...

MR. KITTRELL: Chart 1 shows the principal sources of bacterial contamination discharged to the lower Columbia River, and the relative proportions of contamination from these sources.

Nearly 94 per cent of the total contamination is discharged from the Oregon side, and a little over 6 per cent from the Washington side. Of the total, Portland alone contributes an estimated 89.6 per cent, and Portland and Vancouver together contribute a combined 92.6 per cent. It is obvious that the Portland-Vancouver area is the focal point of bacterial contamination of the lower river, with Portland contributing nearly 94 per cent of the total from this one area.

...Whereupon, Chart 2 was displayed...

MR. KITTRELL: Chart 2 shows the results of the bacterial contamination in the river during the August through November periods of 1953-1957. The large circles indicate the concentrations of coliform organisms in the river water. These concentrations are based on data obtained by the Portland Sewage Treatment Plant for the river just above the Portland-Vancouver area and for a distance of 5 miles downstream from the point at which the Portland sewage is discharged, and on projection of these observed data downstream to Cathlamet on the basis of theoretical considerations.

The chart includes, for comparison, circles indicating bacterial water quality objectives for several uses of water. These objectives were adopted for the protection of the health of water users by the Pollution Control Council of the Pacific Northwest Area. The Council includes representatives of the pollution control and public health agencies of British Columbia, Alaska, Idaho, Montana, Oregon, and Washington, and of the Canadian Department of National Health and Welfare, and of the U. S. Public Health Service. These objectives state, in effect, that: water used as a source of domestic water supply should not contain, on the average, more than 2,000 coliform organisms per 100 milliliters of water; water used for boating and fishing should not contain, on the average, more than 1,000 coliform organisms per 100 milliliters; and water used for swimming should not contain, on an average, more than 240 coliform organisms per 100 milliliters. A fourth objective states that the minimum treatment required for sewage discharged into water used for water supply for drinking, and for bathing, swimming, and recreation, is sedimentation (all primary treatment) and effective disinfection.

The bacterial quality of the water leaving Bonneville Dam is excellent, averaging only 51 coliform organisms per 100 milliliters from January through July, 1958. I doubt if you can even see this circle (indicating on chart) up at Bonneville, it is so small, but it is very good quality water. Sewage discharged above the Portland-Vancouver area increases the coliform organism content to about 1,200 per 100 milliliters, which fails to meet the objectives for water used for swimming and for boating and fishing.

Sewage discharged from the Portland-Vancouver area increases the average coliform organism concentration to more than 23,000 per 100 milliliters, which is 97 times the objective for swimming, and 23 times the objective for boating and fishing. The bacteria die off as the river flows downstream, but at Cathlamet the average coliform organism concentration is still estimated to be 11 times the objective for swimming and 3 times the objective for boating and fishing.

At Longview, where the Weyerhaeuser Timber Company water plant intake is located, the coliform concentration from upstream contamination is estimated to be twice the objective for a source of domestic water supply. Local contamination from Longview increases the contamination at the intake to at least 4 times the objective.

These data indicate that the Columbia River from the

CHART I

LOWER COLUMBIA RIVER

SOURCES OF BACTERIAL CONTAMINATION

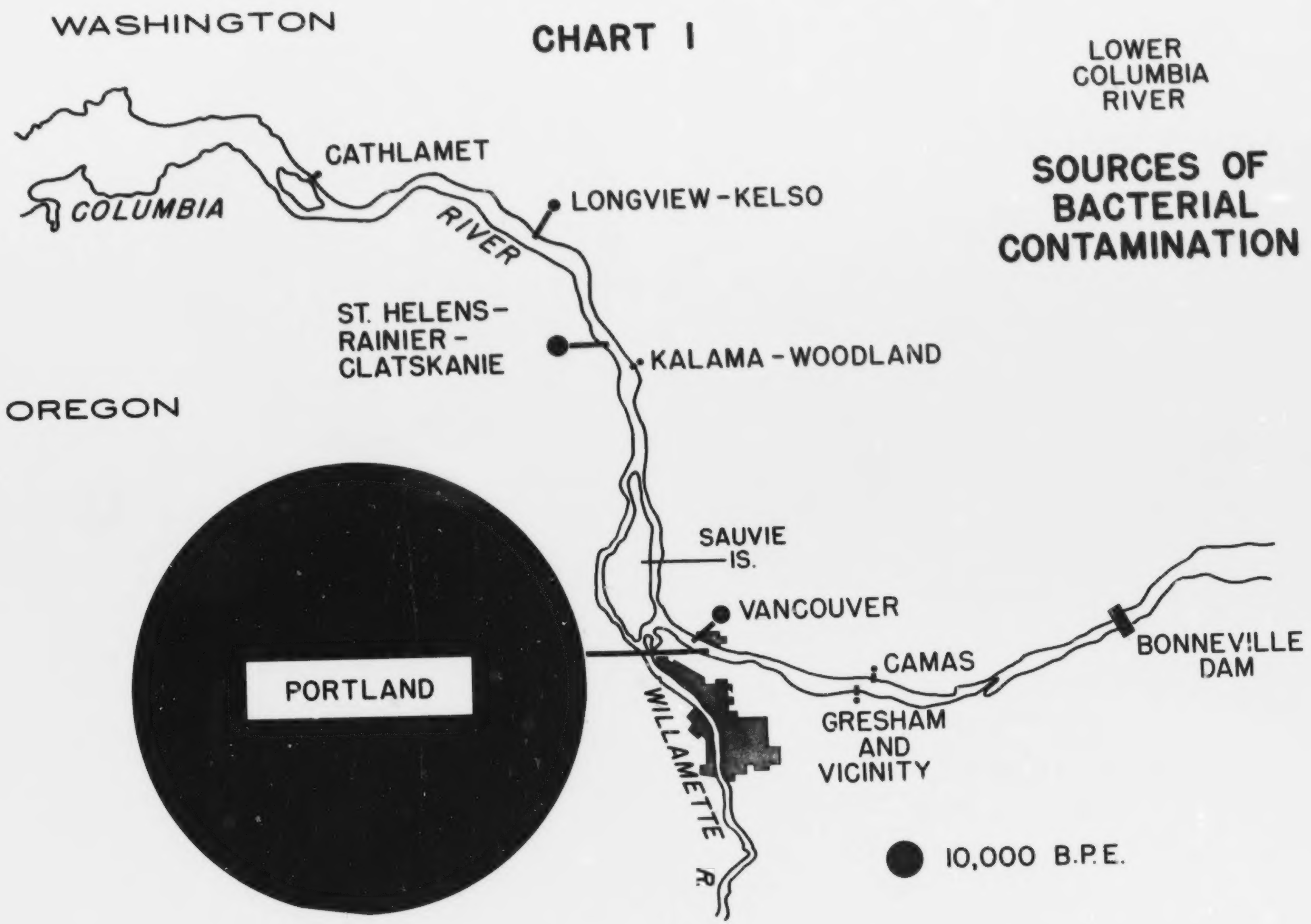
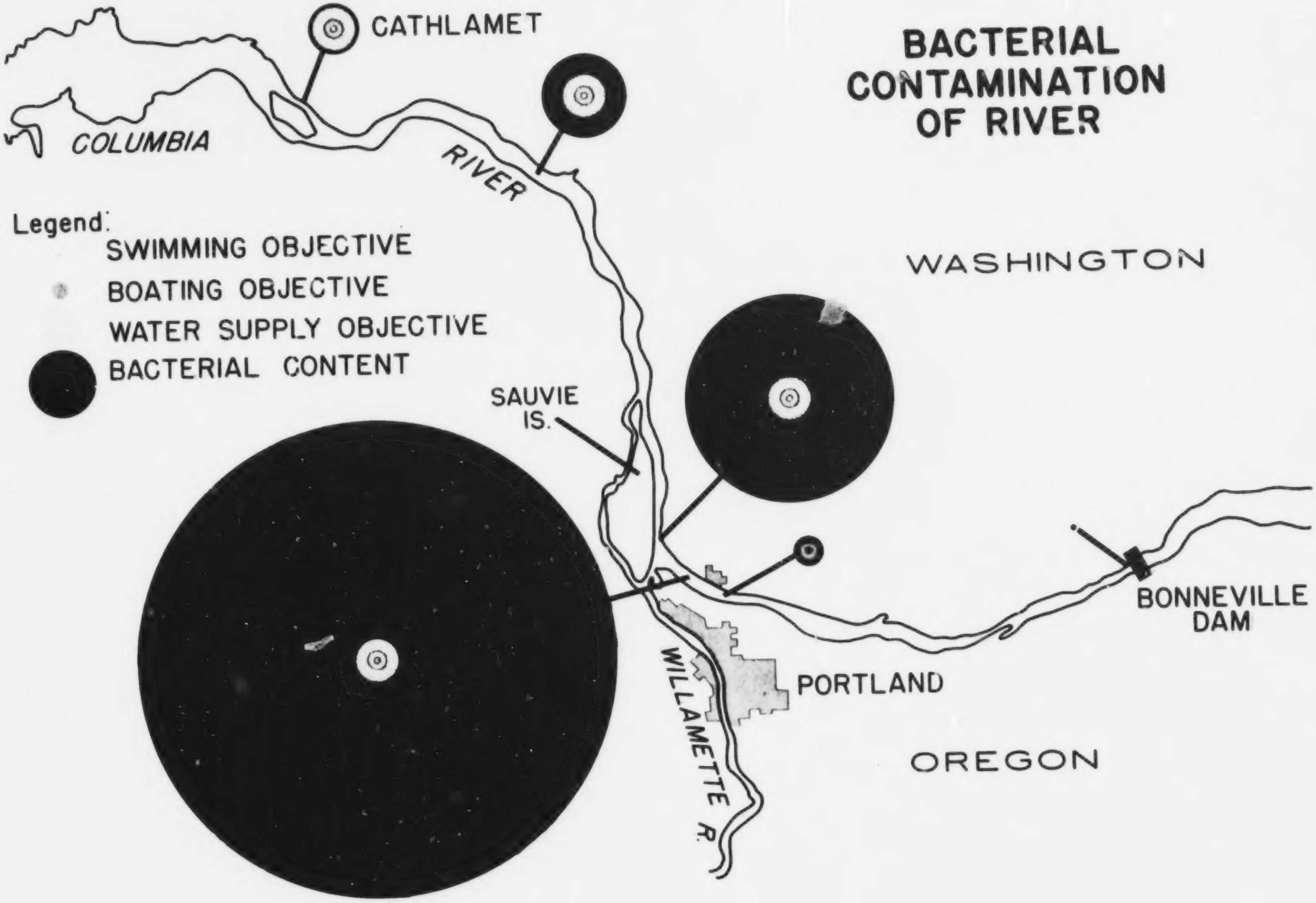

WASHINGTON
OREGON
COLUMBIA
RIVER
CATHLAMET
LONGVIEW-KELSO
ST. HELENS-RAINIER-CLATSKANIE
KALAMA-WOODLAND
SAUVIE IS.
VANCOUVER
PORTLAND
WILLAMETTE R.
CAMAS
GRESHAM AND VICINITY
BONNEVILLE DAM
● 10,000 B.P.E.

CHART 2

LOWER
COLUMBIA
RIVER

BACTERIAL CONTAMINATION OF RIVER


Legend:
SWIMMING OBJECTIVE
BOATING OBJECTIVE
WATER SUPPLY OBJECTIVE
BACTERIAL CONTENT
CATHLAMET
COLUMBIA
RIVER
WASHINGTON
SAUVIE IS.
WILLAMETTE R.
PORTLAND
OREGON
BONNEVILLE DAM

Portland-Vancouver area to Cathlamet fails to meet the established bacterial water quality objectives for any of the uses of this reach of the river. There is a hazard to health to those using the river as a source of domestic water supply, to those who fish and who use boats for pleasure, for hunting and trapping, and for navigation, and to those who swim and water ski. With the exception of the use of the river as a source of domestic water supply, the same conclusions apply to uses of the river above the Portland-Vancouver area for an undetermined distance upstream, possibly as far as Camas, Washington.

Both sewage and many industrial wastes contain organic wastes that may serve as nutrients for bacterial slimes in the receiving waters.

The Columbia River reaches Bonneville Dam with a relatively low organic content, as reflected by an average biochemical oxygen demand of 1.14 parts per million for January through June, 1958. The good sanitary quality of the water at this point is shown also by the dissolved oxygen saturation, which ranged from 92.9 to 115 per cent. Organic pollution from sources above Bonneville Dam has no adverse effect on the river at the dam.

...Whereupon, Chart 3 was displayed...

MR. KITTRELL: Chart 3 shows the principal sources of organic wastes entering the Columbia between Bonneville Dam and Cathlamet. The diameters of the circles are in proportion to the population equivalents, based on oxygen demand, of combined sewage and industrial wastes from the several areas involved.

The combined wastes from Washington sources account for nearly 85 per cent of the total 3,200,000 population equivalents from all sources. Oregon sources contribute a little more than 15 per cent of the total.

Of the total from all sources, sewage from both Washington and Oregon accounts for 9 per cent, compared to 91 per cent for industrial wastes. Pulp and paper mills contribute 87 per cent of the total. One plant alone, the Crown Zellerbach Corporation at Camas, accounts for nearly 47 per cent of the total. This company also has a pulp and paper mill at St. Helens. The two plants combined contribute 51.3 per cent, or a little more than one-half, of the total population equivalents from all sources in the area. The contributions of the Columbia River Paper Mills at Vancouver and the Weyerhaeuser Timber Company at Longview are very nearly the same, with 13.4 per cent and 12.7 per cent, respectively. The Longview Fibre Company accounts for 6.7 per cent, and the Kaiser Gypsum Company, Incorporated, for 3.1 per cent.

The foregoing data do not include one waste that enters the Columbia under unusual circumstances. This is the digester liquor from the Publishers Paper Company pulp and paper mill at Oregon City, which is barged to the Columbia River and discharged below the mouth of the Willamette River. This method of disposal is used only when stream flow in the Willamette is low, usually during the months of July through October. This practice increases the population equivalent of wastes discharged to the river by 400,000, or 12.5 per cent, to a total of 3,600,000. It increases the combined population equivalent of the pulp and paper mill wastes to nearly 90 per cent of the total from all sources.

It is obvious that pulp and paper mill wastes dominate the organic pollution of the lower Columbia River.

For at least 20 years, excessive growths of bacterial slimes have occurred intermittently in the Columbia from Camas to below Longview.

During 1940-1942, the Oregon State Sanitary Authority and the Washington State Pollution Commission cooperated in a study of the slime problem. The results of the study were published in 1943 as a "Report on Investigation of Pollution in Lower Columbia River". As a result of both observations in the river and controlled flowing trough experiments with various types and concentrations of wastes, it was concluded that the slime was Sphaerotilus and that organic constituents of pulp and paper mill wastes were the principal causes of the excessive growths in the river. It was concluded, further, that waste sulfite and sulfate digester liquors contained most of the organic nutrients responsible for the growths.

Observations of the slime growths in the river revealed that they grew attached to submerged stable surfaces, such as rocks, gravel, pilings, docks, and log rafts. Growth areas extended variable distances downstream from points at which pulp and paper mill wastes were discharged along the Washington bank.

The attached Sphaerotilus grows as chains, or filaments, of bacteria surrounded by a sheath. The filaments are encased in gelatinous capsular material. Colonies of the filaments develop into either tufts or plumes. The plumes may be an inch or more in diameter and several inches long. The tufts and plumes break off when they die or when they are affected by increased current velocity or other disturbances. When detached, they float downstream so long as the current is adequate to support them. In quiet areas, away from the current, they settle to form decaying sludge deposits. The floating slimes have a marked tendency to wrap around and adhere tenaciously to any small object that they

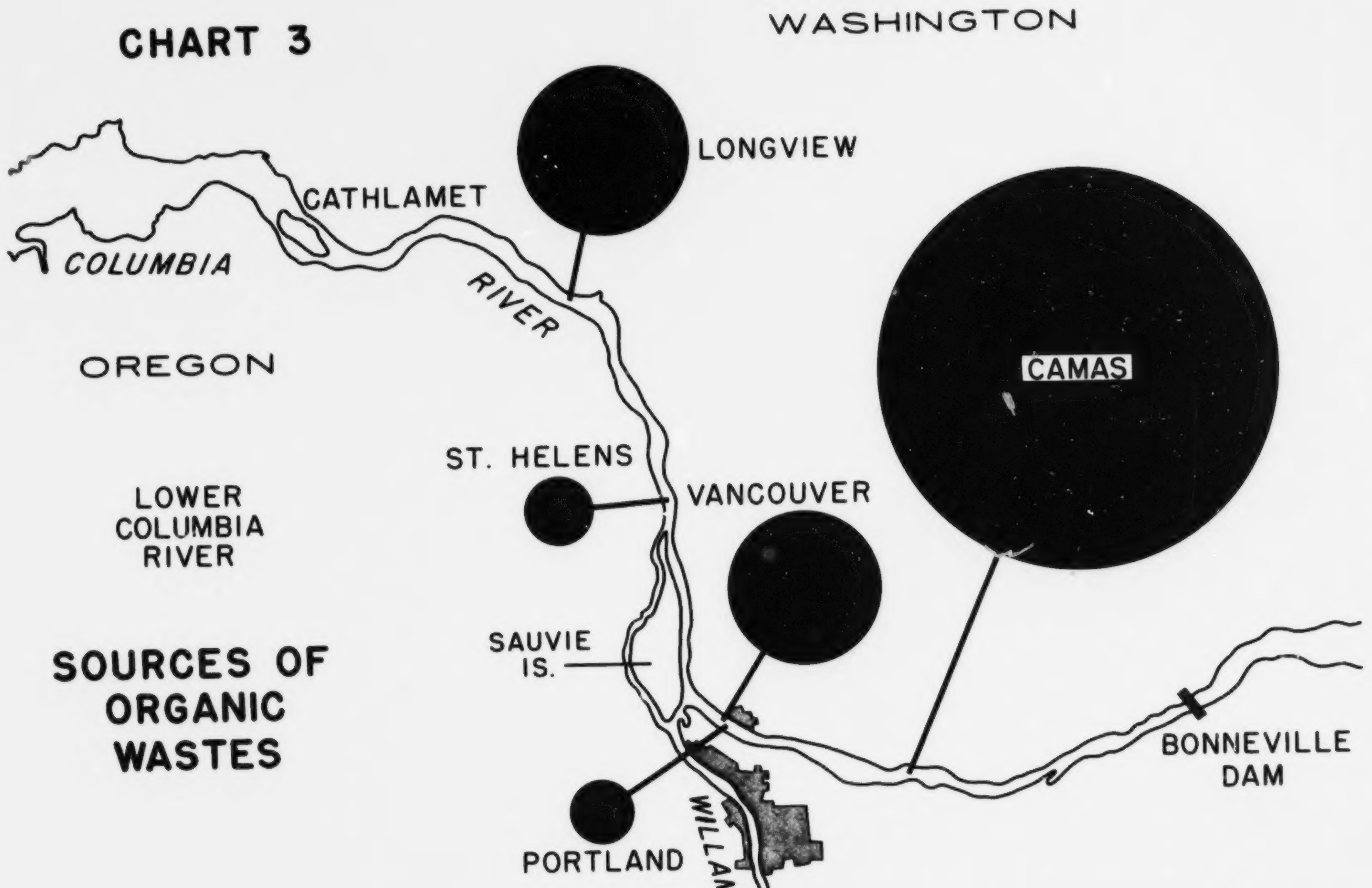


CHART 3

SOURCES OF ORGANIC WASTES

WASHINGTON
OREGON
LOWER COLUMBIA RIVER
COLUMBIA
RIVER
CATHLAMET
LONGVIEW
CAMAS
ST. HELENS
VANCOUVER
SAUVIE IS.
PORTLAND
WILLAMETTE R.
BONNEVILLE DAM
● 100,000 P.E.

encounter. During the 1940-1942 study, the drifting slimes caught on fishermen's nets and inhibited fishing from Camas to the mouth of the Columbia.

Subsequent studies of the lower Columbia River, unpublished observations by qualified persons, continuing complaints by fishermen, and experiences elsewhere have confirmed the conclusions quoted from the 1943 report. All recent evidence shows that the intermittent interference with fishing by slimes continues, despite commendable attempts in the early 1950's by several of the Washington pulp and paper mills to control the problem, either by changes in plant processes, or by improved dilution of the wastes in the river.

The Pollution Control Council, Pacific Northwest Area, adopted objectives to prevent interferences with water uses which would endanger the welfare of the public. The applicable objective in this case states that there shall be no floating, suspended or settleable solids, or sludge deposits attributable to sewage, industrial wastes or other wastes, or which after reasonable dilution and mixture with receiving waters interferes with the best use of these waters.

Many of the studies of pulp and paper mill pollution of the Columbia and elsewhere have included use of the waste sulfite digester liquor determination as an index of concentration of pulp and paper mill waste in the streams. It is useful to estimate the probable contributions to the Columbia River of sulfite waste liquor, or its equivalent, from the plants involved. For this purpose, it is assumed that an average of 2,200 gallons of waste sulfite liquor, containing 10 per cent solids, is discharged to the river for each ton of ammonium or calcium base sulfite pulp produced. For magnesium base sulfite pulp, and for sulfate and semichemical pulp, it is assumed that waste digester liquor equivalent to 330 gallons of waste sulfite liquor, 10 per cent solids, is discharged for each ton of pulp produced.

For this evaluation, it is further assumed that pulp production of the chemical pulp and paper mills involved is the same as their designed pulping capacities reported in the latest Lockwood's Directory of the Pulp and Paper Industry. The actual pulp production of the mills may not equal their designed capacity at any given time. However, it is believed that, over a prolonged period of time, actual production is more apt to approach designed capacity than some higher or lower production which may occur during a limited period.

An exception to the above assumptions is the data for waste digester liquor barged to the Columbia River by the

Publishers Paper Company. In this case, actual data on volumes and strength of waste digester liquor discharged to the river are used.

On the basis of the foregoing assumptions, Chart 4 has been prepared.

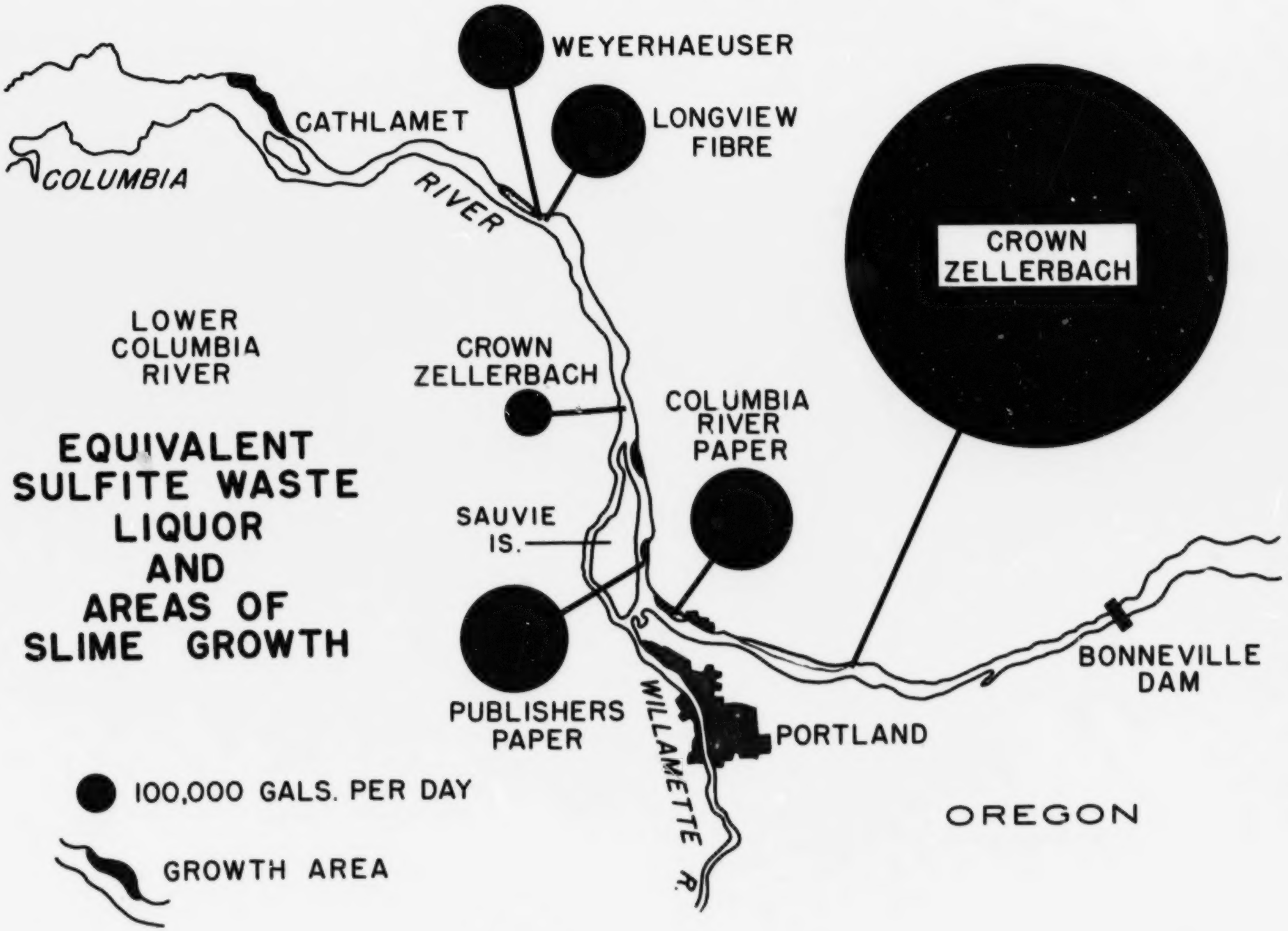
...Whereupon, Chart 4 was displayed...

MR. KITTRELL: It is estimated that the 6 chemical pulp mills involved discharge 2,137,000 gallons per day of equivalent waste sulfite liquor to the Columbia. The circles indicate the relative percentages of this total discharged by the individual mills. The Crown Zellerbach Corporation mill at Camas accounts for 46.3 per cent of the total. Inclusion of the plant at St. Helens brings this company's combined contribution to 52.1 per cent. The contributions of the Weyerhaeuser Timber Company and the Longview Fibre Company at Longview, the Columbia River Paper Mills at Vancouver, and the Publishers Paper Company at Oregon City are relatively close together, all falling in the range of 10.6 to 13.5 per cent of the total.

The estimated total equivalent waste sulfite liquor from all plants would give a waste sulfite liquor concentration of 41 parts per million if mixed completely with the reasonable daily minimum of 80,000 cubic feet per second of flow in the Columbia. When flow of the Columbia drops below 135,000 cubic feet per second, the Bonneville Dam power plant is placed on a peaking schedule. During such periods, flow may be as low as 30,000 to 40,000 cubic feet per second for several hours each night. In 35,000 cubic feet per second of river flow, the combined equivalent sulfite waste liquor would give a concentration of 94 parts per million in the river. At such times, the wastes of the Crown Zellerbach plant at Camas alone could produce 44 parts per million in the river.

Chart 4 also indicates the approximate areas where attached, growing slimes have been observed. It will be noted that growth has been observed along the river bank below the three locations of pulp and paper mills at Camas, Vancouver, and Longview, Washington. In addition, growth has been observed at two areas several miles downstream from Vancouver and at one area many miles downstream from Longview. The reason for these isolated areas of growth is not clear. It is probable that concentrations of nutrients, adequate to support growth, from upstream sources are carried downstream to those areas where suitable combinations of surface area, currents, and water velocities coincide to encourage the growths.

CHART 4



EQUIVALENT SULFITE WASTE LIQUOR AND AREAS OF SLIME GROWTH

WASHINGTON
WEYERHAEUSER
LONGVIEW FIBRE
CATHLAMET
COLUMBIA
RIVER
CROWN ZELLERBACH
LOWER COLUMBIA RIVER
CROWN ZELLERBACH
COLUMBIA RIVER PAPER
SAUVIE IS.
PUBLISHERS PAPER
WILLAMETTE R.
PORTLAND
BONNEVILLE DAM
OREGON
● 100,000 GALS. PER DAY
GROWTH AREA

No growth of slimes along the Oregon side of the river has been reported. Observations have shown that floating slimes occasionally are flushed from the Willamette River into the Columbia during freshets on the Willamette. There are insufficient data to permit evaluation of the relative importance of this source of floating slimes in the overall problem on the Columbia.

The floating slimes interfere seriously with commercial fishing from Camas to the mouth of the Columbia.

Gill net fishermen commonly use a sinker net that is delicately balanced by floats and weights so that it just touches the bottom of the river as it floats downstream, and the bottom of the net conforms to the irregular bottom of the stream. Efficiency of the net in trapping fish that come in contact with it depends partly on the flexibility of the net. When the net is properly balanced and its twine is springy and flexible, it acts almost like a live thing in seizing and entangling the fish.

Moderate amounts of slime attached to a net reduce its flexibility. This reduced liveliness reduces the probability that the strands of the net will entangle the fish. The added resistance of the net to the water also affords the partially trapped fish a better chance to pull out of the net and escape.

Large amounts of slime attached to a net destroy its delicate balance. Instead of drifting in a nearly vertical position, the top of the net leans farther and farther forward, or downstream, as the weight of the fouled net increases. The net may become sufficiently weighted to lie almost flat on the bottom of the river. The lower the top of the net, the greater is the chance that the fish will swim over it and escape.

When the accumulation of slime renders a net unusable, it must be cleaned. Several mechanical methods have been tried, but no method other than picking off the slime by hand has been found to be successful. An average single section of a net is about 6 to 8 feet wide and 1,200 feet long. It may have more than 100,000 knots, around which the slime has an especial tendency to cling. Two or more of these sections may be joined either top to bottom, or end to end, to form a single net.

It is understandable that even partially cleaning a badly fouled net by hand is a formidable and time-consuming task.

The commercial fisherman normally makes about four drifts with his net in a day. Cleaning slime from his net may require so much time that he can make only one drift per day. This causes a serious financial loss.

When slimes are worst, fishermen on some drifts are unable to fish successfully and they may abandon these drifts for as much as a month at a time. Since the open season for commercial fishing is only 131 days per year, this can reduce the annual fishing time of those so affected by nearly 25 per cent.

It is almost impossible to remove all slime from the knots of a net. The small residual balls of slime around the knots keep them moist, and apparently permit some unidentified type of microorganism to attack the twine at the knots. The net becomes weak at the knots and tends to break. The normal three year life of even a well kept nylon net may be reduced as much as a year by this rotting. This reduction of one-third in the life of a $1,500 to $2,000 nylon net represents another financial loss to the fisherman. Linen nets are cheaper, but may last only a year when subjected to the rotting action. For this reason, the fishermen prefer nylon nets, even though they cost about 3 times as much as linen.

Normally, a net should be cleaned in a solution of a copper compound about once a year. Nets fouled by slimes may have to be treated once a week when in use.

There can be no doubt that the slimes impose both hardship and financial loss on the commercial fishermen.

Between 1948 and 1956, there has been a continuing reduction in gill net licenses issued to Columbia River commercial fishermen. This reduction was from 1,102 to 792, for an average of nearly 40 per year. Since 1942, there has been a 50 per cent reduction in the average annual pack of Columbia River salmon when compared with the 15 year period preceding 1942. So many factors are involved in both of these reductions that it is not possible to assess the part played in either by the slimes. There appears to be little reason to doubt that the slimes have been a factor in these reductions in both numbers of commercial fishermen and in annual salmon pack.

The sport fishermen also have experienced the effects of the slimes on this form of recreation.

The experienced sport fisherman claims that his chance for hooking either salmon or steelhead depends to a considerable extent on his knowledge of the exact spots where the fish are most apt to pass in the river, and on his skill in placing his lure in those exact spots.

When slimes are abundant, they can accumulate on the fisherman's line while it is settling through the water and cause sufficient resistance to the current to deflect his lure from the selected spot. Use of a heavier weight to overcome the current's drag makes it more difficult for the fisherman to feel a strike, and also increases the chance that a hooked fish will pull loose from the more heavily weighted line.

Even when the fisherman is successful in placing the lure in the selected spot, the slime may attach to the lure and hide it from the fish.

This problem has caused irritation and complaint by sport fishermen, whose chances of maximum fishing success have been lessened, and whose pleasure in their sport has been reduced.

CHAIRMAN STEIN: Thank you, Mr. Kittrell. Are there any comments or questions from the conferees of Mr. Kittrell?

MR. MILLER: I want to make a comment with respect to the final paragraph on Page 5. I want to point out that the Washington Pollution Control Commission has to date not adopted the specific standards with reference to the lower Columbia River. It's scheduled for an early date. They may or may not be in general agreement with the objectives that are referred to in your material, Mr. Kittrell.

CHAIRMAN STEIN: Are there any further comments or questions? Mr. Poston, do you have any comments or questions?

MR. POSTON: No.

CHAIRMAN STEIN: Mr. Everts?

MR. EVERTS: No, Mr. Chairman.

CHAIRMAN STEIN: As to the report you put into the record, are there going to be more copies available? We've had several inquiries.

MR. KITTRELL: Yes, we have about 175 on the train somewhere between Cincinnati and here.

CHAIRMAN STEIN: They will be made available to the State agencies?

MR. KITTRELL: That's correct.

CHAIRMAN STEIN: I would think, if any people want a complete copy of the report, that is, a copy of Mr. Kittrell's

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summary, they should apply to the appropriate State agency of Washington or Oregon in the near future. As soon as these reports come in, they will make these reports available.

I have a question or two, Mr. Kittrell. Under the Federal Act, interstate waters means all rivers, lakes and waters that fall across or form a part of a boundary between two or more States. I think it's pretty obvious that the Columbia River, and the lower Columbia River here, meets the definition for interstate waters within the meaning of the Federal Act.

The Federal Act also provides that pollution of interstate waters in or adjacent to any State or States, whether the matter causing or contributing to such pollution is discharged directly into such waters or reaches such waters after discharge into a tributary of such waters, which endangers the health or welfare of persons in the State other than that in which the discharge originates, shall be subject to abatement as herein provided.

Now, from your analysis of the facts in this report, is it your opinion that what you have described is covered in this section of the Act?

MR. KITTRELL: That is correct, yes.

CHAIRMAN STEIN: Thank you, Mr. Kittrell.

I would like to make one announcement now. For the folks who have not registered in the back of the room, we would appreciate it, if on your way out at a convenient time, you do sign a registration card.

Now, we do have a slight adjustment in the agenda. The conferees have agreed to call on the State of Oregon first, instead of the State of Washington as indicated in the agenda, and with that we will call upon Mr Everts for a statement on water pollution control in the Columbia River.

Mr. Everts.

MR. EVERTS: Mr. Chairman, I have the privilege of introducing a man who has spent a great many years in the field of water pollution control in Oregon. He has served as chairman of the Oregon State Sanitary Authority since its creation in 1939. I am honored and privileged to introduce to the conferees and to those present Mr. Harold Wendel, Chairman of the Oregon State Sanitary Authority, who will present a statement on behalf of the

Sanitary Authority of the State of Oregon.

Mr. Wendel, please.

MR. WENDEL: Mr. Chairman, Mr. Coe, conferees, members of the conference:

I am pleased to present to this conference a statement on behalf of the Sanitary Authority of the State of Oregon relative to Oregon's program for the prevention and control of water pollution.

Both the State of Oregon and the State of Washington have made good progress in water pollution control during the past ten years. In spite of delays caused by wars, Oregon communities have spent more than $55,000,000 for sewerage facilities since 1945. Sewage treatment works constructed since the program began are now serving over 90 per cent of the State's sewered population, effecting a 55 per cent reduction in pollution loadings on the basis of the present population. As another indication of the progress made, more than $8,700,000 in contracts for sewerage projects in the State have been awarded during the past two years, and more than $8,500,000 in bonds authorized. Except for 1944, when Portland's bond issue was voted, more sewerage bonds were authorized and sold in the past two years than in any other such period in Oregon's history.

Expenditures to prevent pollution on the lower Columbia River alone have exceeded $20,000,000. A list of these remedial works for both domestic sewage and industrial wastes, as well as those under construction, are presented in the Appendix to this statement.

In addition, the Sanitary Authority has pursued a constant and progressive program to reduce industrial waste loads on streams. Industry in general has cooperated in the Oregon pollution control program. Industrial waste treatment and disposal facilities now in use have reduced present-day loadings more than 57 per cent during critical stream flow periods. While no estimates of expenditures by industry for pollution abatement are available, substantial amounts undoubtedly have been spent for research, investigation, and remedial works. More work needs to be done, however, on industrial waste treatment and disposal, so that ultimate objectives may be accomplished.

Upon instruction from the Sanitary Authority, industries on the Columbia and Oregon sloughs have spent a substantial amount of money eliminating pollution by constructing treatment facilities of their own or by connecting to public sewerage facilities.

Plans for both municipal and industrial waste treatment works are approved by the Sanitary Authority on a basis which is both tentative and conditional, and the Authority always reserves the right to require additional treatment facilities or changes in operational procedures whenever public water use so warrants.

If there are additional measures which the Public Health Service feels should be undertaken to protect the waters of the lower Columbia River from waste discharges originating in Oregon, the Sanitary Authority most certainly would appreciate being advised of it. We are prepared to institute appropriate proceedings at any time that a problem is brought to our attention which justifies action, and we are asking for further legislation that will expedite the bringing about of compliance.

The report of the Public Health Service has referred to water quality objectives of the Pollution Control Council. It is our understanding that these objectives were not intended to be standards, but were developed as guides for long range pollution control planning and to be applied with judgment, especially with a view to future development, but it may be expected that the citizens, who have charged us with the responsibility for pollution control, would normally expect the ultimate objectives to be high. They also undoubtedly would expect the accomplishments to be made in an orderly, reasonable and practical manner to conform with present requirements and needs. In fact, Oregon statutes stipulate this procedure.

Since the Council's objectives for bacterial quality, rather than the Public Health Service's "Recommended Sanitary Requirement for Water Treatment System", have been used as standards in this report, we hope that this matter can be brought into its proper perspective at this conference. In order to do so, the Sanitary Authority submits these questions, as a basis for possible action:

1. Has any communicable disease been reported to the Public Health Service as a result of recreational use of the Columbia River?

2. Would the Public Health Service now recommend that the water quality objectives mentioned in the report be adopted as standards applicable to the Columbia River?

The effect of slime in the lower Columbia River has been a source of complaint on numerous occasions during the past years. Details of this problem will undoubtedly be presented by the Washington Pollution Control Commission, and it has also been mentioned prominently in the Public Health Service reports, and the

Commissions of the two States are collaborating on the problem. Studies by Federal and State agencies and by industries, while producing what appeared to be satisfactory interim measures, have not yet resulted in an acceptable solution to the problem. Since we too may be faced with problems of equal magnitude on intrastate streams in Oregon, it is hoped that, as a result of this conference, the Public Health Service can recommend processes or measures which industries in Oregon and Washington can employ to eliminate this problem.

The Sanitary Authority of the State of Oregon fully recognizes that the task of pollution control is a continuing one and particularly that programs, which were planned years ago, must be constantly revised to meet ever-changing circumstances involving stream flows and quality and new pressures for water use. The Oregon Commission is certainly aware of the fact that constant surveillance of the lower Columbia River and its tributaries should be maintained so that water pollution control programs can keep abreast of increases in population and industrial development that influence water use.

We appreciate greatly the assistant of the Public Health Service, and we have every confidence that the cooperation of our two States can bring about and maintain the desired results.

Thank you.

CHAIRMAN STEIN: Do you have any questions or comments, Mr. Everts?

MR. EVERTS: No, sir.

CHAIRMAN STEIN: Mr. Miller?

MR. MILLER: No.

CHAIRMAN STEIN: Thank you, Mr. Wendel.

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...Following is Appendix referred to by Mr. Wendel...

DOMESTIC SEWAGE

Reynolds Metal Company (Troutdale)

This treatment plant was constructed in 1942 and consists of an Imhoff tank with facilities for chlorination of the settled effluent. It was designed to serve 1,000 people. The treated effluent discharges into a small lake or lagoon before reaching the Columbia River.

Gresham - (Population 3,480)

The city of Gresham constructed and placed in operation a modern, primary sewage treatment plant in 1955. This plant is designed to serve a population of 10,000 people and has additional capacity for seasonal industrial waste loads. The plant provides for sedimentation, separate sludge digestion, sludge dewatering, and chlorination of the settled effluent.

Portland Airport

Sewage treatment facilities consist of primary clarification, separate sludge digestion, sludge dewatering, and effluent chlorination sufficient to serve a population of 3,000. This plant serves both the Portland International Airport and the Air Force Base.

Portland (Population 412,100)

In 1952, Portland completed and placed in operation its sewage treatment plant designed to serve 500,000 people. The plant consists of primary clarification and separate sludge digestion. Chlorination of the effluent has not yet been provided. Disposal of sludge is by discharge into a lagoon.

Associated Meat Company (Portland)

Wastes from this plant are provided with pre-treatment and are now discharged to the Portland interceptor sewer system.

Pete Wess Hog Farm

This establishment has not been in operation for the past two years.

St. Helens Pulp & Paper Company (St. Helens)

Wastes from production of wood pulp by the Kraft process are discharged without treatment into Multnomah Channel approximately one mile above the confluence with the Columbia.

Publishers Paper Co.

Spent sulfite liquor from the production of 105 tons of sulfite pulp is barged from Oregon City to the main channel of the Columbia River daily and discharged under controlled conditions. This method has been considered acceptable as long as diffusion of wastes from other pulp mills along the Columbia River continues.

Kaiser Gypsum Company (St. Helens)

Wastes from production of insulating board are discharged without treatment into Scappoose Slough, a tributary of Multnomah Channel. Point of discharge is approximately two miles from the Columbia River.

The following industries and communities either discharge their wastes onto land or into tributary streams and not directly into the Columbia River. There appears to be no evidence that they contribute any pollution to the main Columbia River.

Alderwood Dairy -- wastes disposed of on land.

Columbia Pickle Co. -- has lagoon with overflow into drainage ditch which eventually discharges into Columbia Slough.

Columbia Wool Scouring -- is connected to old outfall sewer of City of Portland which discharges into Columbia Slough. City has been advised to connect this plant to interceptor system.

Swift & Company

Domestic sewage from this industrial plant is treated by means of septic tanks and effluent chlorination.

St. Helens (Population 5,189)

Sewage treatment facilities are under construction at St. Helens at the present time. These facilities will consist of primary clarification, separate sludge digestion, sludge dewatering, and chlorination of the effluent. The treatment plant is expected to be placed in operation in 1959.

Rainier (Population 1,325)

Bids for the construction of a sewage treatment plant consisting of primary clarification, separate sludge digestion, and effluent chlorination will be opened September 10, 1958. If favorable bids are obtained, construction of the plant will be undertaken in the immediate future.

Clatskanie (Population 888)

A new sewage treatment plant consisting of primary clarification, sludge digestion, sludge dewatering, high-rate trickling filter, final settling, and effluent chlorination was placed in operation in 1958. It has capacity to serve a population of 1,400. It discharges into the Clatskanie River approximately three miles above the confluence with the Columbia.

INDUSTRIAL WASTES

Swift & Company (Portland)

Pre-treatment of industrial wastes is provided and is considered adequate for the present time.

Portland Union Stockyards (Portland)

Has no treatment facilities at present time but has been instructed by the Sanitary Authority to provide such facilities for both domestic sewage and industrial wastes.

Electro Metallurgical Co. -- has treatment for removal of cyanides with effluent being discharged into Columbia Slough.

Leatherman Oil Co. -- wastes discharged into a lagoon adjacent to Columbia Slough.

Montag Stove Works -- has subsurface disposal of domestic sewage. No industrial wastes.

Pacific Carbide & Alloy Co. -- effluent discharges into a lagoon with overflow to Columbia Slough.

Pacific Meat Company -- has pre-treatment works with effluent being discharged into Columbia Slough. Injunction proceedings have been filed in the Multnomah County Circuit Court by the Sanitary Authority against this company.

Portland Rendering Co. -- has pre-treatment works with effluent being discharged into Columbia Slough. Company has been instructed by Sanitary Authority to provide additional facilities.

Bissinger & Co. (Troutdale) -- in 1956 installed sedimentation facilities which are considered adequate for effluent discharged into Sandy River.

Multnomah County Farm -- has secondary sewage treatment (standard rate trickling filter) with effluent chlorination. Effluent goes to small stream in Sandy Drainage District.

Wood Village -- has secondary sewage treatment (standard rate trickling filter) with effluent chlorination. Effluent is discharged into same stream as Multnomah County Farm.

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MR. EVERTS: Mr. Chairman, the Fish Commission of the State of Oregon has indicated that they desire to make a statement before this conference.

Is there a representative of the Fish Commission here, who is prepared to make that statement?

MR. JAMES: Mr. Everts, I know the statement was prepared. It apparently has gone astray in some way in transmission.

CHAIRMAN STEIN: Would you identify your name for the record?

MR. JAMES: M. C. James, Research Coordinator of the Pacific Marine Fishery Commission. I was asked to speak in behalf of the Fish Commission, although I'm not actually representing them.

MR. EVERTS: Would you like to make that statement at this time, or do you want to wait?

MR. JAMES: If the appearance of the Fish Commission could be postponed until later, their statement will be ready at that time.

MR. EVERTS: Will that be acceptable, Mr. Chairman?

CHAIRMAN STEIN: Yes, sir.

MR. EVERTS: The State Parks Department has indicated that they desire to make a statement before this conference. Is there a representative of the State Parks Department present?

MR. DUNLAP: Mr. Chairman, conferees:

My name is R. C. Dunlap. I'm with the Oregon State Parks Division. We have prepared a statement for the record. However, we have no oral comments to make.

CHAIRMAN STEIN: Would you care to read that statement for the record, or do you just want to submit that statement? Do you want to have it read?

MR. DUNLAP: I don't think it's necessary.

CHAIRMAN STEIN: Would you read it?

MR. DUNLAP: If it's the desire of the --

CHAIRMAN STEIN: I would think for the purpose of the conference and the folks that have come here that it is desirable to have the statements, if they're relatively short, to be read into the record because the transcript of the conference obviously will not be available for some time, and the people who are in attendance would not have the benefit of your position or of what you are going to say.

MR. DUNLAP: This is a brief statement, so it wouldn't take long.

CHAIRMAN STEIN: I will appreciate your reading it then for the record.

MR. DUNLAP: This relates to the recreational use and values of the lower Columbia River.

The Columbia River is the largest waterway in the Northwest where recreation has important economic benefits and is the third ranking industry in the State of Oregon. It may be assumed that, as increasing demands are made for water for municipalities, industry, and irrigation, there will also be greater future demands for use of the water of this river for recreational purposes. All factors point to a continuing increase in outdoor recreation and, in the past half dozen years, that pertaining to water has become especially important. Sustained interest in fishing, the new interest developing in boating and water sports, and the continued interest in swimming, all point in this direction.

A good example is the present interest in swimming in the lower Columbia area around Portland as exemplified by the new Rooster Rock State Park, located 23 miles east of Portland. The first year this park was opened to use in 1957, the annual attendance amounted to approximately 350,000 persons. Swimming is the main interest at this park, drawing most of its visitors, and all attendance records point so far to increasing use. Up to the end of July, 1957, this amounted to about 168,000 persons and for an equal period in 1956, approximately 290,000, indicating that the annual usage for 1958 will probably exceed a half a million persons.

With the construction of new dams on the Columbia equipped with navigation locks, there will come more use by pleasure craft and the river will become a safer place for the use of small boats. A pioneer example of this is the small boat cruise that took place this year from Clarkston, Washington, to Astoria, a total distance of 512 miles. Interest in boating is increasing all along the river. During April, 1958, at Hermiston, Oregon, there was formed the McNary Aqua Capers, which is an organization to promote water sports and water commerce. Membership was drawn from seven towns in this area, including Pendleton. The yacht and boat clubs from Portland make extensive use of the river and island areas, as do other towns along the lower Columbia.

Sports fishing, of course, has always been a great attraction. Chinook, steelhead, and some silvers are extensively fished for in the lower Columbia and tributary streams.

When one considers the investment in recreation facilities, boats, water sports and fishing equipment, some idea of the overall value of the lower Columbia River for recreation purposes is realized. At the present time, the Oregon State Parks

Division of the State Highway Commission has five state parks on the Columbia River below Bonneville Dam, in which water interest is the main attraction. In the case of three of these, it represents primarily a scenic attraction, such as at Sheridan, Crown Point, and Bradley State Parks. Although this is also true of Rooster Rock and Benson, the added interest of swimming and boating at Rooster Rock is predominant, as well as swimming at Benson Park. While no figures are readily available as to the total investment in these parks, it is estimated, for example, that at the present time, and after only two years in a developed state, there is a half a million dollar investment in the physical plant at Rooster Rock, including provisions for access from the Columbia River Freeway. It may be expected that this investment will continue to increase in proportion to the use. Metropolitan Portland, for example, according to a report by the U. S. News and World Report, will have a population in 1975 of approximately 1,400,000, as compared to the present day metropolitan population of over 800,000.

We feel that, if pollution in the lower Columbia River continues to increase to the extent that it creates a harmful effect to recreational values, including fishing, swimming, boating, water sports, and the scenic aspects, there will not only be a sizeable loss in recreation investments dollar-wise, but also in the personal welfare benefits that it brings to its users.

CHAIRMAN STEIN: Thank you, Mr. Dunlap.

Do any of the conferees have questions or comments to ask Mr. Dunlap?

MR. EVERTS: I haven't any.

MR. MILLER: No, sir.

MR. EVERTS: Mr. Chairman, the Columbia River Fishermen's Protective Union has indicated that they would like to make a statement to this conference and would like the privilege of calling on Mr. Westerholm, or whomever he designates, to make a statement at this time.

Before the Columbia River Fishermen's Protective Union presents their statement, Mr. Miller has called to my attention a matter that I overlooked, that this statement is being made in behalf of not only the State of Oregon, but also as one of the participants for the Washington State Pollution Control Commission.

CHAIRMAN STEIN: Thank you.

MR. WESTERHOLM: Mr. Stein, conferees:

My statement today will be on the pollution occurrence in the river from November 1st of last year up until the final date.

In the first part of November of 1957, pollution occurre in the Columbia River at Vancouver, Washington, and when the fishing season closed on November 28th of that year, pollution was noticeable all along the river from Vancouver, Washington, to Harrington Point, Washington, in the lower river. Some fishermen were unable to fish due to heavy concentration of pollution on certain drifts.

There was some pollution noticed prior to that time, but it was of no hindrance to the fishermen.

The winter fishing season started January 29th, 1958. The pollution was in heavy concentration in the upper part of the river, occurring mostly from Vancouver to St. Helens, Oregon, but due to heavy rains, which made the river rise, it moved on down the river.

Reports came in from all along the river, Kalama, Rainier, Clatskanie, Wauna, Skomokawa, Altoona, Astoria, and even below Astoria on out to the ocean.

When the river started its raise, it started the pollution moving down the river with heavy concentration in certain areas, causing fishermen to quit fishing. Due to the fact that the fishing season was closed in December and all of January, the pollution must have been present in the river at this time.

The river did clean up fairly well in the last week of February.

On the 12th of March, E. L. Peterson made a drift in front of Astoria for smelt and he encountered a net full of pollution, showing pollution was still in the river.

On snagging operation at St. Helens on the Hewlet Drift, March 27, 1958, the pollution was very thick, a report made by Charles Fleming.

The Brickyard Drift, April 14th, some pollution noticed.

Puget Island, pollution very severe, made by snag operations in that area on April 15th.

Pollution not too strong at Kalama, April 8th to 12th, as reported by snag operations.

Pollution very severe. The pollution is of the old type, probably been in the river a long time, made at Kalama, April 21, 1958, during snag operation.

During the May, June and July fishing season, the fisher men reported no heavy concentration.

On July 29th of this year, a report came in that pollution was occurring at St. Helens and at Vancouver, and pollution was becoming heavier by the end of the fishing season on August 25th of this year.

It appears that the pollution occurs in the river during the low water stage and, according to this, pollution occurs in the river approximately six months out of each year.

We have a list of signatures of gill netters, who feel that they have lost part of their earnings on days when they were unable to fish due to pollution in the river. Our fishing days, including all seasons, amount to 130 days, and a day lost means a great deal.

Reports made by fishermen indicate that during the time pollution is in the river their hands break out with a rash, and, if it comes in contact with the eyes, it causes a burning irritation.

I have a report by Mr. Lawrence Powell, who wasn't able to be here. May I submit his report to the conferees?

MR. EVERTS: If you would please.

MR. WESTERHOLM: Also, a list of fishermen that have signed this petition.

CHAIRMAN STEIN: May we designate those as Oregon Exhibits Nos. 1 and 2.

...Whereupon, the documents referred to were marked Oregon Exhibits Nos. 1 and 2, respectively, and such documents accompany the original transcript of the conference...

CHAIRMAN STEIN: Is that all?

MR. WESTERHOLM: And I also have pictures of pollution in nets on the Columbia River.

CHAIRMAN STEIN: How many pictures do you have?

MR. WESTERHOLM: Well, there are only four, I think.

CHAIRMAN STEIN: May we designate those as Oregon Exhibit 3-A, 3-B, 3-C and 3-D.

...Whereupon, the photographs referred to were marked Oregon Exhibits Nos. 3-A, 3-B, 3-C and 3-d, and such pictures accompany the original transcript of the conference...

MR. WESTERHOLM: Another thing, I have some solutions of water samples that were taken offshore at low tide directly across the Union Fish Co-op at Rainier, Oregon. The pollution is a brown type of pollution. It doesn't seem like the regular type that's in the water. That was a surface test.

...A water sample was displayed...

MR. WESTERHOLM: This test here was a bottom test at the same time. You can drink that water, and that was taken July 13, 1958.

...A second water sample was displayed...

MR. WESTERHOLM: This test was taken from a floater net on the Hewlet Drift at St. Helens, Oregon, August 25th, 1958.

...A third water sample was displayed...

MR. WESTERHOLM: I thank you.

CHAIRMAN STEIN: Do we have some questions or comments from the conferees?

MR. EVERTS: I have none.

MR. MILLER: No questions.

MR. POSTON: I'd like to ask Mr. Westerholm a question. You spoke here on pollution. Would you give us a description of what you mean by pollution?

MR. WESTERHOLM: Well, pollution would be industrial waste or -- that's mostly what we know about it -- it's that slime that gets in our nets.

MR. POSTON: In other words, you're referring to this sphaerotilus?

MR. WESTERHOLM: Sphaerotilus.

MR. POSTON: And the other type fungus organisms as coliform?

MR. WESTERHOLM: That's right. It's this type of pollution -- I don't know what it is -- this brown stuff. It's dumped at night, not during the day, and it causes a brown effect on the water, and it does drift along -- well, on tidal effect. If the tide is at high water, this stuff will accumulate in one certain area, and you can see it very much at night.

CHAIRMAN STEIN: Mr. Westerholm, what you referred to as pollution is this slime getting on your nets?

MR. WESTERHOLM: Yes, sir.

CHAIRMAN STEIN: Would you say in your opinion that that interferes with commercial fishing in the area?

MR. WESTERHOLM: Yes, very much. This other statement by Lawrence Powell of Puget Island shows the effect on diver net and floater fishing.

CHAIRMAN STEIN: Now, that brown material you spoke of, aside from observing it and seeing it, does that cause any difficulty.

MR. WESTERHOLM: I've talked to fishermen on this deal and, when they took this sample, they were fishing for blueback at this time. They caught blueback on the upper side of that, which shows the blueback were going back out to sea, while they were in it.

CHAIRMAN STEIN: Well, in other words, are you saying that the fish come across that material, and then that provides an impediment to the fish and blocks them, so they won't go up there, or what effect does that have?

MR. WESTERHOLM: That's what it does. The blueback fish is a fast-swimming fish, and it's on its way to its spawning ground, and some of the fishermen have noticed that, when their nets are in half of this and half in clear water, they catch the blueback on the lower side of the net in the clear water, and the other side is empty.

CHAIRMAN STEIN: I didn't quite understand. Let's see if we can get that, as to what that does to the fish. What would happen if a blueback fish comes across that brown material? What would the fish do? Would it swim through that?

MR. WESTERHOLM: Well, they have caught blueback in this brown stuff, but they have caught it on the back side of the net, which shows that they're moving downstream to get out of it. See what I mean?

CHAIRMAN STEIN: Yes. Now, have any of the fishermen, who have reported outbreaks on their hands or irritation of their eyes, gone to physicians to get medical attention?

MR. WESTERHOLM: There's a few. There's one doctor that I -- I don't know where he moved to -- he used to treat them, treat a lot of fishermen for this rash, and what it was called, I don't know. On irritation in eyes, I've had it in my eyes. You don't get rid of it for three days or so.

CHAIRMAN STEIN: Now, you didn't cover in there a fact which Mr. Kittrell alluded to in his statement, and that is the effects on your nets. Do the slimes have an effect on your nets when fishing, in the maintenance of them?

MR. WESTERHOLM: Oh, yes. Our next speaker probably will take that one up.

CHAIRMAN STEIN: Thank you. I have no further questions. Thank you, Mr. Westerholm.

MR. EVERTS: In Mr. Westerholm's letter of August 22nd, he asks if it would be possible to have two people represent the Columbia River Fishermen's Protective Union. I replied to that letter, Mr. Chairman, that they would be most cordially invited to have two speakers if they desired.

Do you have another speaker, Mr. Westerholm?

MR. WESTERHOLM: Yes, sir, Mr. William Puustinen, and he is our Conservation and Legislative Chairman.

MR. PUUSTINEN: Mr. Chairman and conferees, ladies and gentlemen. I am William Puustinen, Legislative and Conservation Chairman of the Columbia River Fishermen's Protective Union, with offices at Astoria, Oregon, and I have a statement here that I suppose you would like to have me read. It is a bit lengthy, but I would like to bring up all of the points that we have here. They are of an overall nature, above and beyond the remarks that were made by our Secretary, Mr. Westerholm, and I would like to read it and then comment on some of the points afterwards. I have some comments I would like to make myself, and I would also like to be available for questions on the statement.

CHAIRMAN STEIN: Go ahead.

MR. PUUSTINEN: Statement of the Columbia River Fishermen's Protective Union to the joint meeting of Oregon, Washington and United States river pollution control authorities studying the problem of Columbia River mainstem pollution, September 10 and 11, 1958, at the Lloyd Center, Portland, Oregon.

The commercial fishermen of the Columbia have the same heavy responsibility for maintaining the Columbia's once abundar salmon resource as the lumbermen have for maintaining the forests and the farmers have for maintaining our agriculture.

Farming and fishing produce our organic food materials and are, therefore, most important in determining whether we live or die. Both operations need abundant water in healthful condition. Clean water is necessary for our personal use. Clean water is truly the basic necessity to all life blood.

The salmon resource of the Columbia is today valued ranging from $15,000,000 to $25,000,000 annually. We have destroyed over 75 per cent of the Columbia's original habitat area for spawning and rearing salmon, and the remaining habitat area is badly shot by pollution, denudation of protective green forest cover over the watersheds, overdrainage of waters, and by other factors.

Had we maintained our original Columbia salmon habitat area in its healthful condition up to date, we obviously should have t day a fisheries income in modern values ranging from $100,000,000 upward, annually.

Add to this figure our positive gains from artificial aids to the salmon resource, such as hatchery operations, artificial rearing of young fish, opening up of never before utilitzed spawning and rearing areas, increasing knowledge in disease control, feeding and predation control, and this annual total production on the original habitat should truly be tremendous indeed. It is a shame on everyone responsible for this present depleted state of our Columbia salmon resource.

Today, we have many corrective works going on, trying to restore the Columbia salmon. Among these projects is our effort to abate the pollution of the Columbia. Pollution of the Columbia mainstem can nullify all restoration work on all the many branch streams. The Columbia River fishermen have plenty of evidence of pollution in the heavy masses of slime and sludge caught in their nets during fishing operations.

This slime and sludge definitely hinders commercial operation of nets by fouling the web to the point that webbing cannot enmesh the fish that strike the net. Extra heavy slime actually sinks the net to the bottom to be buried beneath the refuse there.

Today we find this pollution destroying even our nylon nets which we hoped would stand the chemicals in today's pollution. We do not know exactly what chemicals are involved in this nylon net deterioration. We know only that our nets break down soonest in those places in the river where the present pollution conditions are the heaviest.

We have seen dead and dying young salmon at various times and at different places along the Columbia. We have seen great quantities of polluting material poured and dumped into the river. Although much has already been done by both Oregon and Washington in studying the various sources of river pollution and in trying to bring about reasonable abatement, there is obviously a vast unknown field remaining for research for the whole field of Columbia River pollution control is mixed up in too much controversy for good progress in abatement.

It is not the intent of the Columbia river commercial fishermen to bring in more controversy to this picture, nor is it the desire to escape any blame for the depletion of our salmon runs we may be responsible for individually or collectively as commercial fishermen. We are moved only by the desire to do everything possible to restore and maintain our salmon resource at as high a level of production as is possible and practical, but we do recognize the fact that our present Columbia River pollution is hindering our actual fishing operation. We do know that it is unnecessarily destructive of our gear and equipment, costing us unnecessarily heavily thereby.

We do know that salmon are killed by toxic agents found in the Columbia. We do know that aquatic organisms, that form food for salmon and trout, are equally killed by toxic poisons. We honestly suspect a great number of situations, but have no laboratory tests as yet to support or refute our suspicions. We do know that with all the aid to the salmon resource we do give today we still do not have the proportional returns in mature salmon coming back to the river we should have. Pollution may be killing off far more salmon, directly or indirectly, than any of us really know yet.

In order to bring our fishermen's thoughts into clearer focus for all of us to consider and work on, we wish to outline roughly our position as follows:

An appreciable beginning to the solution of Columbia River pollution has been initiated by authorities of Oregon and of Washington, and by certain industries and municipalities. This is a particularly meritorious record so far when we recognize that almost all of this work on the Columbia had to be done with little or no local precedent or fore-knowledge to guide us.

After 1935, in particular, when the Columbia River fishermen attempted through direct court action to obtain a legal opinion on responsibility for Columbia River pollution, we have seen our legal position clarified by court and by legislative action in both Oregon and Washington. We now have some precedent of our own.

We now have State authorities with expanded powers, greater facilities and an increasing public conscience backing our authorities in their work of pollution abatement.

We also find many industries now looking seriously into their own futures, deciding to cooperate with this cleanup movement and no longer resist the growing pressure for cleanup.

Civic-minded citizens from all walks of life are joining in greater and greater numbers to work for clean waters everywhere. So, we do have a real beginning to our Columbia pollution control job.

The Columbia River pollution picture is too controversial and misunderstood yet for efficient progress. This is a point we honestly feel must be faced by all of us interested in the ultimate solution.

Under this point, it is only necessary to point out that the Columbia is truly an interstate stream. It actually forms the legal boundary between the greater part of the division between Oregon and Washington. Neither State has legal rights to move into the waters of the other for pollution control details or research, project planning and construction, or for enforcement. Yet, the waters of the Columbia eddy and churn from shore to shore, and are split by islands and in general mix up the water-borne problems of pollution from upriver points so that down river parties in either State have very real difficulty in assessing the pollution damage directly to the responsible parties and in enforcing even present regulations, and present regulations are not identical in the two States, nor are the compositions of the State pollution control authorities the same.

Under this situation, many fair-minded Washingtonians feel that it is the Willamette River community of Oregon with its extensive developments that contributes most to this present Columbia pollution. Equally, many Oregonians point to their local Willamette Valley pollution control projects and say that Camas, Washington, Vancouver and Longview are bad polluters of the lower Columbia.

To further confound this picture, Idaho has paper mills, sugar mills, vegetable and fruit canneries, mining operations, and lumbering operations, whose sewers lead to the Columbia there. The Federal Government itself now has property and installations with sewers flowing into the Columbia.

Even Canada may soon become an industrial polluter directly, or an agent interfering with efficient pollution control in the lower Columbia, merely by withholding Columbia flows in Canada at critical river stages of the lower mainstem.

Thus, it is evident that for legal clarification alone and for legal facility in research, project planning, and in regulation, we need today a legal organization including the States of the Columbia Basin and the Federal Government. Only under the directions from such an organization can we expect research crews to feel free to study any Columbia pollution problem in their special line of work, regardless of what State it may originate in. Only under such an organization can proper pollution control projects be set up most efficiently for an overall result. Federal aid funds too can then readily be utilized to aid the States and local workers.

With the Federal tie-in, such an organization can more forcefully present to Congress such items as may need Congressional O. K.'s for funds. It can also deal sooner with Canadian-United States pollution control features of the eventual Columbia River plans.

The success of the present Oregon-Washington Columbia Fisheries Compact shows us how we can work on our interstate pollution problem of the Columbia under a similar compact, but this does take much work and time in each State and in Congress.

However, under the provisions of Public Law 660, we hope that these same ends might be met without going to the delays and hardships of trying to set up an interstate pollution control compact. This meeting today of the authorities of Oregon and Washington and of the United States Health Service is very heartening indeed to the commercial fishermen. This meeting represents to us the sincere spirit of cooperation needed to get a working solution of our present Columbia pollution in time to save this present remnant salmon resource and to pave the way for eventually building this resource up to its maximum potentials for both commercial and recreational uses.

As a second part under point 2 of our outline, we wish to point out several points of misunderstanding in the actual field work so far. For instance, it is often cited that experimental batches of fingerlings salmon have been successfully immersed in pollution effluents. Most often, these citations come from the ambitious folks from the polluting concerns or groups. It is further cited that the oxygen content of said effluents was up to or even above the minimum oxygen requirements for salmon, and, therefore, the inferred conclusion is that such effluent is in no way damaging our salmon fishery.

We also see two page advertisements in magazines of national circulation purporting to show how industry solved the sewage problem in a large western salmon stream by installing a giant Goodrich Rubber Company's pipeline and valve system along the bottom of the river with myriads of mature salmon swimming happily downstream to spawn in the ocean, we presume. Yet, millions of people over the United States read such ads and are thoroughly confused from realistic pollution control to thinking that pollution along the bottom of the river is no problem at all.

Pollution on the bottom not only loads our nets but covers the bottom with its poisonous wastes, thus barrenizing what is normally the area in which an abundance of aquatic organisms exist or begin their existence. Most of these organisms form food for young salmon and trout and must be preserved just as carefully and cultivated just as methodically as the grasses of our beef pastures.

Fingerling salmon can indeed swim in certain effluents for a while seemingly without dying immediately, but, if the effluent contains longer-acting toxic poisons to the fingerlings themselves, or poisons toxic to any large group of fish-food organisms, or contains even dead sludge enough to coat the bottom organisms under a suffocating blanket, then eventually our salmon will have to die just as certainly as if they were killed outright at the instant of immersion in the effluent, and, certainly, pouring heavy effluent along the bottom of a salmon river is an absurdly naive way of trying to solve our Columbia River pollution.

There is quite a misunderstanding seemingly existing even among higher pollution control workers in that some of these workers seemingly treat the river as if it were a lake or some currentless and immobile body of water. Zones of oxygen occurrence are cited sometimes from actual lake or pond references and used in discussing our river pollution. This is really a grave error and certainly is not intentional, but does lead to all kinds of confusion when we realize that in the moving, eddying and boiling river we can have pollution effluents, aquatic organisms and fish moving at times in any depth and in any portion of the river. An eddying boil of upwelling toxic poisons from an underwater sewer can form the killing flame that destroys all fish and aquatic organisms coming in contact with it. Fish may have come hundreds of miles from their beautiful Salmon River natural spawning grounds of Idaho only to be killed by the poison flows out of the Longview sewers.

There are temporary dead pockets in back waters and slow eddies where the normal river readings for temperature, oxygen or toxic chemicals just do not hold. Effluents moving through the same areas can compound normally adverse river conditions to explosively poisonous conditions.

Under point 3, we would like to suggest some newer fields of study we feel are contributing also to the presently known industrial and domestic effluents entering the Columbia. Log rafts with bark intact on the logs lying for long periods of time in any river moorage, or a heavy accumulation of logs anywhere, we feel should be studied and measured for the leeching out of tannic acid, wood sugars, and so forth, into the streams. Log rafting and long-time accumulations of sunken bark, we feel, has been the destroyer of the shad and chum salmon runs in many Oregon and Washington tributaries and sloughs of the Columbia as in Youngs River, Lewis and Clark River, Burnside and Svensen Slough, Knappa Slough on the Oregon side, and Gray's River, Elochomin and Cold Creek on the Washington side.

Heavy logging preceded the disappearance of shad and chums at these locations, and we feel that the logs and bark were the contributing factors that wiped out the once heavy shad and chum populations at these places. It is our theory that the shad and the chums, moving to the sea at very early stages after hatching, were thus more susceptible to the logging poisons than were the silverside salmon and the steelhead trout.

We would also like to see a scientific study made of the pollution effect of heavy logging debris left to rot after clear-cut logging, as compared to burned-over logging residue as further compared with just normal residue of an unlogged or even a long-term selective logging show. We feel that here may be one factor which so suddenly shoots our pollution picture far out of line with the known polluters of mills and municipalities.

We also urge a most accurate study of the effects of modern insecticides and herbicides on fish and aquatic life whenever and wherever these materials can escape into fisheries waters through careless use or through the natural action of rain washing and floods.

We suggest a critical study of modern detergents and such cleaning agents and of excessive chlorination in their effects on fisheries waters and fish and fish-food organisms. Verv small amounts may be destructive to salmon and trout.

We hope that our suggestions and thoughts can be constructive to the considerations of this meeting. We feel that we are reaching an important new milestone in our pollution control work of the Columbia when the two States of Oregon and Washington can sit down with the Federal Health authorities to try to work out a plan helpful to all parties concerned. Success here will automatically mean eventual success likewise with all other States in the Columbia Basin.

Now, a moment ago, gentlemen, the point of pollution effect on migrating fish was brought up by Mr. Westerholm and some questions were asked. Now, I feel that there is a further explanation necessary there to understand how the fish act when they -- how the ascending fish in the Columbia River or any salmon stream react to offensive water, whether it be polluted water, excessively acidic water, or excessively high temperature, or any other factor that salmon don't like.

They react to this just as last February when they showed their reaction to the pollution and started to come out after the first fall rains hit the Willamette and the lower Columbia tributaries. Our commercial season opened on January 29th and extended through the month of February. I was out personally myself on the first day of the season, and there were a few nice chinook in the lower Columbia. The water was fairly clear-looking on the surface, and it wasn't too bad on the first drifts or so that I made.

About the second or third day, we began to hit the first outgoing movement of pollution. This was mostly broken down sphaerotilus residue. It wasn't the sphaerotilus itself, but it was a residue of the sphaerotilus that was showing up in my nets as far as I could tell at that time mostly. There was also quite a lot of slime.

Now, the interesting point I want to point out there is that, as soon as this movement came down with the bulk of the Willamette and Cowlitz and local rivers expanding under the floods at that time, the fish turned immediately around and went right straight back out to sea, and, for approximately a week, we never got a single fish again. In about another week, almost to the day, there was enough cleaning up of the river, and the rain flows had sort of leveled off, the river settled a bit, and the fish slowly started to come back again, but not to any great extent. There was still quite a lot of motion on the bottom of the river, but I was fishing on the surface and I did not get quite as badly a load of it in our nets as Mr. Westerholm and his men did who were fishing along the bottom, but I got enough to follow it along pretty well percentage-wise.

In about another week, I had thought that we would be fishing and operating normally. Lo and behold, here comes another burst of rainy weather that we had just had, and its effects hit the lower river about that time. Out went the fish again. They went out three times definitely and successively in February, and right at the end, the last five days, we had a few fish coming in over the remnant area of the pollution still flowing out, and that is the only fishing we had commercially to speak of in February last year or this year.

Then also the same thing happened in May, but not over the pollution that we were considering in February. We think that was mostly due to the industrial and municipal and local human-caused type of pollution. But, in the month of May, the salmon that had been coming in since the February closure of commercial fishing through March and April had been progressing up the river -- we don't know exactly how far -- but they had been progressing quite a ways up the Columbia until they hit a natural pollution condition. This was a pollution condition due to the excessive heavy rainfall and snow melt in the area of Pendleton and Umatilla and that part of Oregon, where there are heavy soil deposits of Alkali. We have known for most of the 40 years I have spent with the fisheries that every time that we have a heavy alkali flow breaking into the river, that has exactly the same effect on salmon, and, no matter where the fish are, they will just turn right around and go back down to sea, and, just as Mr. Westerholm said, what fish you'd catch, you caught on the upper side of the net. They just high-tailed around to the ocean for the protection of the seemingly cleaner and clearer water in the ocean for the time being.

Then they come back up the river again. That is natural, the instinct of the fish. If they cannot stand the water condition of the river, whether it be pollution from human sources, whether it be natural pollution, or whether it be excessive temperature, or any other reason, the fish will recede back toward the ocean again, or as far back as they can stand the condition or the effect of the water.

Now, that may help some of you folks to understand the peculiarities you run into this pollution study of the Columbia. Now, we would like to see these problems, that we suggested, studied under the Columbia situation and under the factors that prevail here, and we would like to have a solution to the saving of the salmon made as soon as possible because today most people take it for granted that the Columbia has 10, 15, 20 or 25 million dollars worth of salmon a year, and that's it. We're not satisfied with that at all. I have lived long enough to know, and I have seen local salmon large enough, that I absolutely feel, without any bragging or any excess talking at all, that there is a potential on the Columbia River where we can see yet, in spite of the developments that are put up against the salmon, that, if we correct some of the features we now have destroying the salmon, we have a potential that probably will be somewhere between 100 million or 150 million for overall salmon production, originating in the Columbia system. That would be recreational and commercial fishing, ocean fishery, and all other fishery combined.

Certainly, if there is a potential of that nature, while I can't say for sure that there is -- but yes, I can project over known facts that we have to work on -- but, certainly, we have that sort of an annual income that we're destroying by not taking care of our resource.

It certainly behooves us to go ahead and work toward that, and that's why we, as commercial fishermen, feel so intensely interested in this subject. We feel that, as the report cites, that salmon coming from any amount of artificial water or natural propagation areas in the upper river can suddenly be in great blocks wiped out by pollution. Blocks in the lower river area may be temporary for only several hours.

You have the great amounts of effluents coming out of Vancouver, out of Longview, out of the Willamette Valley. Suppose now -- well, first, the way that the tide affects the river here now, you have another compounding factor, that the pollution will be flowing more or less normally in a normal stream down along the sides that they originate on, but you have the tide of the ocean coming back and blocking the current and tending to force the current back upriver again. Now, as the tide hits the islands and the sand banks and different physical features of the river, it has to eddy and boil in conformance with those obstructions. Naturally, that will break up the normal channel flow of the water from the upriver points and even swing it clear back on the other side of the river. So, you do get trapping pockets of the river-polluting effluents to come into being where they do actually entrap and encircle great quantities of fish.

You see, in the first place, the fish will tend to evade the feeling of poison or polluted water. They will back up and away, but your tidal action can actually encircle them and kill them, and I think that is the reason we have sometimes had such heavy showings of dead fish. Again, in the next day or so, the tide is different, the wind is different, and we may not have that.

As to the effect of the polluted water on human skin, I can suggest this much personally, that in a personal experience up on the McKenzie River at the head of the Willamette, a few years ago, when the heavy pulp industry began its operation there on the McKenzie and there was no particular concern of the pollution effluent, I had occasion to work on a bypass canal, a cutting job in that area a mile below the Umpqua, and my hands burned from the sulphur liquors to the extent that my hands were pretty badly peeling and checking after days of working in that discolored and heavily polluted water.

Today that has been corrected, and I don't know that you would suffer that any more, and those people, those industries have done and are doing a very fine work in that locality in cleaning up that pollution, but the same effect I noticed in the water while fishing in February, so that I presumed that the same toxic agent that caused the burning on my hands below the Weyerhaeuser mill at Springfield were and are at work today on the lower Columbia. Now, this I want to make as a tie-in possibility there.

I have no laboratory test to prove my point, but I suspect again here that, if the Weyerhaeuser pollution four years ago was able to dissolve the scales off the salmon and trout and killed off numbers of fish, even bullfrogs, that we found lying dead on the beach, certainly that same toxic poison, now coming from the other mills on the lower Columbia, must be killing off those live organisms and young salmon and even large salmon, because you know the gill structure is very delicate and it doesn't take very much to burn the gill tissues, and the fish dies.

Now, gentlemen, that is my statement. I'm sorry I made it so lengthy. Any questions?

CHAIRMAN STEIN: I have a few questions. Do any of the conferees have questions or comments?

MR. MILLER: I have none.

MR. EVERTS: No questions.

CHAIRMAN STEIN: Mr. Puustinen, as I understand, you directed your remarks to damages; one, if corroborated, the reported effect by Mr. Westerholm of the skin irritation, and, two, you talked about the fouling of nets and lines with slimes and sphaerotilus. Then besides that, you've talked about toxic substances injuring fish or injuring fish-food.

Now, that is the part that I am a little unclear on. I might go back. You talked too about concentrations of pollutions which creates conditions which cause salmon and other fish to go back to sea, and that you've observed.

Now, as far as the toxic conditions, one time a flat statement was made that fish are killed by these toxic poisonings. Another time, you pointed out that there was no laboratory evidence, and then you made some statements relating to the killing of bottom organisms and the problem of fish and fish-food.

Now, what I would like to get from you is whether these are recommendations from you for appropriate study, or whether by observation or other information you know that these materials actually did kill fish or did kill organisms that fish feed on, if they did coat the bottom of the stream.

MR. PUUSTINEN: I wish to make it clear, in the first place, that I assume no status of an expert or anyone with due precision to speak as I may sometimes seem to speak. I am a layman and a commercial fisherman and only acting in that capacity, but the things that we -- first, when I say that we do not have laboratory tests of the materials, I meant the commercial fishermen themselves. We don't have the facilities nor the finances to get laboratory tests nor laboratory work, and that's what I meant.

We may suspect something from our personal views in the field and the findings in the field. In fact, we may be quite presure of it personally, but we still for absolute scientific presentation would have or should have laboratory tests for the measurements you could make the picture of. We do not have that ourselves.

CHAIRMAN STEIN: Have you personally or any members of your organization observed fish kills, substantial fish kills?

MR. PUUSTINEN: We have. There is one now on record with both the Oregon Game Commission and the Oregon Fish Commission as I had occasion to call both authorities to the scene, and their field man, Chris Jensen, certified here about four years ago, or it would be five now, and the actual record will show that it happened below the Springfield section of the Weyerhaeuser Timber Company's pulp mill, in that area. I use there a reference more than anything else because of several reasons. The first is that, when the pollution first came from the mill, it was very heavy and heavy spots would form, and the fish would disappear from that side of the stream for quite a ways downriver -- I don't know how far, but at least a mile below the outfall on the property there, and we just couldn't get any fish in there, but they were in the green water on the opposite side where the effluent didn't reach them. The strong currents brought it down without any tidal interference quite normally in the same pattern day after day.

Now, what did happen when the fish kill occurred there, there was as high as 40 to 50 specimens lying just within one man's vision on the beach suddenly of all kinds of fish, and, when I mentioned toxic poison, Mr. Jensen will confirm that the scales even off this scrap fish, which are very rough scales, were completely gone. It wasn't a matter of just losing a few scales from contact with rubbing on the bottom, or something of that kind. Every bit of the scale was gone. So, we presume that toxic agents through the sulphur action dissolved the scales, and that is the only thing we can say, and we may be wrong. We think you might again have laboratory facts to back you up on that.

CHAIRMAN STEIN: Would you care to point that area out on the map?

MR. PUUSTINEN: (Indicating on map) It would be up farther than you see here.

CHAIRMAN STEIN: Up the Willamette?

MR. PUUSTINEN: Yes.

CHAIRMAN STEIN: We're dealing here with the mainstem of the Columbia River. Do you have any information as to any fish kills on the mainstem of the Columbia River?

MR. PUUSTINEN: We have on the mainstem. At times, we have practically every year in February at Svensen's Slough, and that seems to be about the time that the first pollution flows come out. I suspect that some of those young salmon and the chums and other fish are killed by the first breakaway of the heavy pollution concentration, whether they are laying on the bottom and feeding on the bottom cover and are covered by the sludge, or if a heavy freshet water breaks them loose, and whether that releases new polluting toxic concentration, I don't know, but it's something strange in the river, with fish going back and forth seemingly all right. At least, a lot of them get by.

Then, all of a sudden, you get these fish kills, and we don't see anything wrong, except, as I say, a laboratory test could probably tell whether they got poisoned, or whether it's something else.

CHAIRMAN STEIN: Could you tell from the basis of your experience and knowledge as to the frequency, that is, how often do they have that? Several times a year, or once every several years?

MR. PUUSTINEN: Seemingly now, the last two years the fishermen reported a few young salmon and chum kills, and I've noticed it two years successively in Svensen's Slough, a number of dead fish in February and around the first of March. So, that gives a possibility there. They seem to show up in the slough outside. It's mostly young salmon. We don't at this time know of the larger fish. The larger fish may be heavy enough to stick to the bottom and just stay there. It's a hard thing to say for sure what it is, but we suspect pollution because we don't know of any other agent we could lay it to at the time.

CHAIRMAN STEIN: Mr. Miller would like to ask a question.

MR. MILLER: When you notice these fish kills, do you routinely report these to the Oregon Fish Commission?

MR. PUUSTINEN: Yes, every time I notice them. I know I've reported everything I personally have noticed, and I've encouraged the other fishermen to do likewise. Of course, sports fishermen are like other humans. They see something like that and then say "Yes, we have seen the fish." Well, we have lost many, many fish samples that should have been turned in, but we have actually had some turned in. I myself turn in every single one that I can find, whenever I can, in order to call attention to the authorities to come in and see them actually in the field before I take them out, which is still better for the technician to observe, rather than for me to just turn them over secondhand.

MR. MILLER: I asked that because I just checked with our people, and, insofar as we can remember, I think probably they remember that we have no reports of fish kill on file in the Washington Pollution Control Commission.

MR. PUUSTINEN: On the Washington side?

MR. MILLER: I mean, in general, we are not getting these reports.

MR. PUUSTINEN: We have not made any reports, I don't believe, to the Washington Commission because we have made our reports to Oregon.

MR. MILLER: I was just surprised to hear some of your statement when we didn't have anything in our record.

MR. PUUSTINEN: May I add just one little bit on that for this reason, it is a contributing factor only and the reference went only for this lower river study. I don't want to leave the impression here that that is a bad situation. Rather, I am happy to say that personally as a commercial fisherman interested deeply in the concern of the resource that today the industrial people there at the Weyerhaeuser plant are doing the most commendable job in cleaning up and have from the year they first started operating. I have absolutely no aquatic life on the beach on my property where the effluent strikes, but today I've seen the gray sludge decrease to a very light skim on the bottom. I've seen the color of the river water improve to almost a green color, the normal McKenzie flow. On the other side of the pollution, the flow would current, and more than anything else that tickles me is the currents of fresh water shrimp among the green algae is beginning to show and growing where nothing but the gray sludge grew for years. So, they are beginning to reach the point of biological botanical possibilities for solution of the McKenzie problem.

I didn't want to leave that in your mind as a bad picture. It was a bad picture.

CHAIRMAN STEIN: Thank you, Mr. Puustinen.

MR. EVERTS: Mr. James, are you prepared now to deliver the statement for the State Fish Commission?

MR. JAMES: Yes, sir.

MR. EVERTS: Mr. Chairman, I would like to introduce Mr. Milton James, who will give us a statement on behalf of the Fish Commission of the State of Oregon.

MR. JAMES: Mr. Chairman and conferees:

Mr. Dean Marriage, who would normally represent the Oregon Fish Commission in presenting this statement, is in another conference, which was set up some time ago and one that he could not miss, and he has asked me to act as pinchhitter and present this prepared statement.

It should be pointed out at the outset that the Fish Commission is primarily a regulatory and management agency. This State agency is charged by legislative statute with the duties of protection, preservation, propagagation, cultivation, development and promotion of certain fishes, including salmon, steelhead, striped bass, sturgeon and other anadromous or food or shellfish. Observations on pollution have been secondary to other duties. Generally speaking, as pollution problems affecting fish are noticed by the Commission's field personnel, they are referred to the Oregon State Sanitary Authority for appropriate action. Certainly those pollution problems affecting fish and fish life are every bit as important to the ultimate supply of fish as a material obstruction in the path of migrating fish, such as a high dam or an impassable falls, or over-fishing, gravel removal, disease, and so forth. However, to avoid duplication of effort, pollution matters, as they are noticed, are referred to the Oregon State Sanitary Authority for their action.

We feel it is necessary to explain that the future of the Columbia River anadromous fish runs, as seen today, is seriously threatened. The construction and proposed construction of dams above Bonneville across the mainstem of the Columbia, on the Snake River and other tributaries by various governmental agencies and private companies threaten to cut off upriver spawning areas and change the overall ecology of the system. Under the Columbia River Fishery Development Program, a cooperative effort between the Federal agencies and the States of Washington, Idaho and Oregon, about 15 million dollars have been spent on rehabilitation of old hatcheries, construction of new fish cultural stations, removal of stream obstructions, laddering of impassable natural barriers, and so forth. This was undertaken to offset the impact of past dam construction on fish. In addition, more than 125 million dollars have been spent on fish facilities at the Columbia River dams. It can be seen that every effort is being made to maintain these valuable anadromous fish runs in the Columbia River system.

It is apparent then that the fishery agencies of the Pacific northwest are expending every effort to maintain these valuable runs of anadromous salmonids. Because of the peculiar life history of the species of salmon and steelhead, which spend most of the growing part of their life in the ocean and return to fresh water as adults to spawn, there is not a period of the year when one or more species in some stage of development cannot be found inhabiting the Columbia River. This makes it very important that water quality suitable for fish and fish life be maintained the year round.

The Fish Commission recognizes the existence of a slime problem in the lower Columbia as evidenced by the sliming of commercial fishermen's gill nets. While there has been no direct evidence gathered by our staff, it is a well known biological fact that a reduction of the food supply of fish is caused by smothering and by reducing light penetration by the presence of excess suspended matter in waters.

Complaints from commercial fishermen have been received by this office on the physical interference of large quantities of slime with the fishing efficiency of gill nets. On one specific instance, it was reported that a serious slime condition existed during early February, 1958, in the vicinity of the OK drift, which is near St. Helens. Fishing reportedly had to be discontinued because of the quantity of slime present.

We have reviewed the Report on Pollution of Interstate Waters of the Lower Columbia River, Bonneville Dam to Cathlamet, Washington, August, 1958, prepared by the U. S. Department of Health, Education and Welfare, Public Health Service, and generally concur with the observations reported and conclusions reached by the Public Health Service in regard to the effect of pollution on fish and fish life in that area of the Columbia River under consideration. The fisheries values and statistics quoted are substantially correct.

In summary, the Columbia River contains very valuable runs of anadromous fish which the conservation agencies of the Pacific northwest are endeavoring to maintain and, if possible, increase. Every management tool known is being employed. The fact that no major damage to fish and fish life has been demonstrated in our statement is due to the lack of observations by this agency. It appears certain that pollution in the quantity being released into the Columbia River below Bonneville Dam, as witnessed by the magnitude of the slime problem, is having a detrimental effect on fish and fish life, particularly in food production. Future uncontrolled releases of pollutents into the Columbia River should not be allowed.

Mr. Chairman, that concludes the prepared statement of the Oregon Fish Commission.

CHAIRMAN STEIN: Thank you, sir.

MR. JAMES: As representative of Pacific Marine Fisheries Commission, I might, with your permission, very briefly mention one other point which might not be brought up by other agencies, and that is the point that, whatever the adverse effects of pollution in the area under consideration may be in terms of fish production in the Columbia River, it will have an impact, a very serious impact probably on areas very far removed from this particular stretch of the river. This is due to the fact that the chinooks and to a much lesser extent possibly the silver salmon of Columbia River origin are taken in the commercial ocean troll fisheries from -- certainly from the coastal area of Oregon right on up to southeast Alaska and British Columbia, of course, and would also as a matter of course be taken in whatever sport fishery is occurring there.

This has been demonstrated by marking and tagging experiments, which have been conducted over a period of years, and there is very clear-cut evidence, which is being confirmed each year, that the Columbia River chinooks particularly are a very significant element of these commercial fisheries as far north in 1958 as the northern extremity of the Gulf of Alaska.

So, there is an economic impact from whatever loss we incur, way beyond the limits of the area under consideration.

CHAIRMAN STEIN: Thank you, sir. May I clarify that? You say that affects ocean fishing from Oregon, Washington and Alaska?

MR. JAMES: That's right.

CHAIRMAN STEIN: Not south?

MR. JAMES: The movement of these Columbia fish is generally northward, but there is some rather scanty evidence that they may be taken as far south as northern California. We cannot confirm that.

CHAIRMAN STEIN: Thank you, sir. Are there other questions or comments?

MR. EVERTS: I have nothing.

MR. MILLER: No questions.

CHAIRMAN STEIN: Thank you very much. We just have two more statements from Oregon participants. After that, we will recess for lunch. That will probably be the best place to break, between Oregon's presentation and Washington's presentation. So, if you will bear with us just a little longer, Mr. Everts will call on his other participants.

MR. EVERTS: Mr. Chairman, it is my privilege to call on a representative of the Interstate Committee on Pollution Abatement to present a statement to this conference.

MR. SCHENCK: I can't get out of this trap. (Laughter) Mr. Howard E. Nelson, who is Co-Chairman of the Interstate Pollution Abatement Committee, will present the statement for the Committee. I will present one for the Columbia River Sportsman's Council.

MR. EVERTS: Mr. Nelson.

CHAIRMAN STEIN: Mr. Nelson, are you also representing the Washington side of the picture?

MR. NELSON: Mr. Chairman, the Interstate Pollution Abatement Committee is composed of persons on both sides of the river. So, I can fit on either side.

CHAIRMAN STEIN: Well, I think you have also been invited as a participant from Washington.

MR. NELSON: In the initial letter, yes.

CHAIRMAN STEIN: I would like the record to show that you are participating as a representative -- as an invitee of both Washington and Oregon. Thank you.

MR. NELSON: Mr. Chairman, I am Howard Nelson, Co-Chairman of the Interstate Pollution Abatement Committee, a committee composed of commercial fishermen and sportsmen working together for pollution abatement on the Columbia River, or anywhere else in the northwest.

The basic rule for the use of public waters is that these waters shall not be polluted or spoiled for the use of others. Danger, damage or inconvenience to others is not compatible with this basic rule. Anything added to public waters to make them unhealthful, unserviceable or harmful to people or to any useful or interesting animal or plant inhabitant thereof is contrary to public interest.

The above statement was made by Dr. H. E. McMillin to Mr. Milo Moore, Director, Washington Department of Fisheries, on December 16, 1957.

The present polluted condition of the Columbia River certainly violates this basic rule. It is a well known fact that the Columbia River contains a highly detrimental amount of Sphaerotilus. The causative factors for this slime are also well known.

The point may be argued that Sphaerotilus or some other pollutents have a direct effect or a secondary effect on commercial fishing nets, but the fact remains that the stuff causes expensive nylon nets to break and deteriorate very rapidly. These nets are not cheap. It also gets on nets in such large quantities that the fishermen cannot keep their nets laid out because they do not float properly. The nets have to be brought in and cleaned, thus causing the fishermen to lose time which they could otherwise use in fishing.

In addition to these expenses, the pollution in the Columbia is so bad that it eats the paint from fishermen's boats, and they have to be repainted and more often than those boats above Camas, Washington.

It is obvious that all these examples of the effects of pollution violate the cited basic rule because they do cause damage or inconvenience to others.

Sports fishermen too are affected by Columbia River pollution. The lines of the fishermen become covered with Sphaerotilus, and it is almost impossible to reel in the lines. Fishing lines become brittle and break when a salmon or a steelhead is caught. In addition to this condition, the fishing lures become covered and do not work as they should to catch fish. As a consequence, sports fishermen, who spend many thousands of dollars for fishing gear, gasoline and other items, are prevented from catching fish because of the actions of others.

The sports fishermen pay other penalties for fishing in the Columbia. Their boats have to be painted more often than boats in non-polluted areas. The water lines in outboard motors get plugged up from goop in the river, and the motors are damaged, and, as a result, the sports fisherman has the added expense of a repair job on a damaged motor. The sportsmen also get their hands, clothes, and inside of their boats covered with dirty, stinking slime and other forms of pollution from the river.

I do not believe that it could be argued that these conditions do not violate the basic rule that was initially quoted.

In a very few years, the City of Vancouver will be forced to obtain an additional water supply. The most obvious source of supply is the Columbia River, and engineers are seriously considering it. The polluted condition of the river will force the City of Vancouver and the residents therein to pay large sums of money for extensive purification processes, which would not otherwise be necessary.

The Columbia may not be so polluted as the Pennsylvania Schuykill River, which was "too thick to navigate, too thin to cultivate", but, if effective, positive abatement action is not taken, the Columbia will attain the same dubious distinction. At the present time, some cities dump sewage directly into the river. Pulp mills pour their effluent, some using the diffuser lines. Quite often, these lines are eaten through by pulp mill chemicals, and any reputed benefits of diffuser lines are lost. Industries along the Columbia, with rare exceptions, "let her go" directly to the river. Pulp mills at Oregon City, restricted from dumping into the Willamette, barge their goop to the Columbia and dispose of it.

Being just a layman, I will not go into the chemical and physical effects of pollution on salmon and steelhead fingerlings, as this is an area in which the chemists and fish biologists can hassle, but it is doubtful that the fingerlings, which are observed on the Washington side below pulp mills, floating on their backs dead or gasping, are in this condition because of any clear water they may have been exposed to. It is recognized that the major factor in the almost complete disappearance of the Atlantic salmon was pollution.

I have just received word that the Montana Fish and Game Department have definitely established the fact that the discharges from the Waldorf Paper Company, in Missoula, Montana, killed fish in the Clarks Fork of the Columbia. They too complain of Sphaerotilus. Conservationists in Idaho are also having their pollution problems.

These region-wide like situations point up the fact that the entire Columbia River drainage should be reviewed for pollution abatement action. Increasing industrialization of the northwest, especially along the Columbia and its tributaries, will bring with it added pollution until the rivers here will actually attain the same reputation as the Schuykill River.

The Interstate Pollution Abatement Committee has been advocating Federal intervention by the U. S. Public Health Service on the Columbia River. We feel that such action is absolutely necessary in order to attain the degree of abatement necessary to restore and to retain water quality. We know too that on this point battle lines will be drawn that will be essentially the same as they were when the battle of life or death was fought over the passage of Public Law 660 and subsequent appropriations for its continuance. Fortunately for our public waters and the users thereof, the conservationists won the battle and Public Law

660 was passed and also subsequent appropriations to keep it operative.

Mr. Chairman, I thank you for the opportunity of appearing at this meeting.

CHAIRMAN STEIN: Thank you, Mr. Nelson. Will you wait there just a moment? For the sake of the record, I think we should point out that the example you have used of the Schuylkill River in Pennsylvania, while formerly acknowledged a grossly polluted stream, has through the efforts of an active State program, cooperative between the locality and the industries involved, been substantially cleaned up. In the east, I think all parties, including the conservationists, regard that as one of the modern miracles of our times.

Let's see if we have any more questions.

MR. EVERTS: No questions.

MR. MILLER: I have none.

CHAIRMAN STEIN: Thank you very much.

MR. EVERTS: Mr. Schenck, are you ready to file your statement?

CHAIRMAN STEIN: Mr. Schenck, are you representing both Oregon and Washington too?

MR. SCHENCK: No. I represent the Columbia River Council, which is an association of some nine clubs on the Oregon side of the Columbia River, Mr. Chairman. I am C. C. Schenck.

I speak for the Oregon Columbia River Sportsman's Council, who is interested in eliminating pollution wherever it may occur.

There are few of our members who are educated in the science of pollution control or abatement. By observation and contact, we can all make positive statements that pollution exists to the detriment of fish life and other water uses. Slime, pulp, Sphaerotilus, collecting on the bottoms of our rivers, would certainly in time eliminate aquatic life on which our fish feed. Studies of the pollution in the Columbia River by Lincoln and Foster in a report issued in 1943 indicated a severe condition due to Sphaerotilus. Fifteen years, and we still study. Are conditions any better after fifteen years of study? Will another fifteen years solve the problem, or will a bad condition become progressively worse?

I would like to quote from a pamphlet published by the Washington Pollution Control Commission in 1953, in which Cedric Lindsay, Biologist, Washington State Department of Fisheries says on Page 18: "The young salmon may be actually starving to death because their accustomed feeding areas have been destroyed by pollution."

Arthur Carhart, of Denver, Colorado, who is Chairman of the Water Policy Committee of the Outdoor Writers of America, in a memo report to the association on Pollution Abatement in the Pacific Northwest in 1957 commented on the general powers of the Washington Pollution Control Commission:

1. Control and prevention of pollution.

2. Setting rules and regulations and standards and enforcing them to prevent pollution.

3. Determining what constitutes pollution. "That is one thing on which we need a reasonably established standard."

We, as sportsmen, conservationists, and seekers for clean waters, cannot tell you exactly what causes what and how detrimental it is to all forms of aquatic life. We can tell you, however, there is a condition in our rivers where our fishing lines foul up with a foul smelling slime so bad the odor won't wash off without warm water and soap. Our brass lures will tarnish or discolor in 20 to 30 minutes so they are ineffective. We know of a case where foreign matter in the river stopped the water inlet of an outboard motor causing its destruction.

We have a report of a new pulp mill in Valdosta, Georgia, where water is returned to the stream 98 per cent pure. We know water of the Willamette below Oregon City was clean enough to drink some forty years ago. We know the health authorities now say it is not safe for swimming. We know certain crafts, such as tug men and fishermen, who are exposed to the waters of the Columbia, tend to suffer from a rash, particularly if abrasions are present.

I have a letter here from a gentleman, a doctor in Rainier, which indicates that it possibly could come from the effects of the pollution of the river.

We know in many areas fish are taken from the water and used for food where the condition of the water is far worse than any ever found in a hog pen. We know conditions of pollution will vary with different flow of the river, at times clean and no pollution. We know the tides change the flow of the river every day. We know it is not exactly fair to ask one community or industry to clean up without compelling all to do so.

We know the Oregon Sanitary Authority has done a tremendous job in cleaning up bad conditions, and yet industrial growth and increased population have caused their efforts to slide back within 13 per cent of what it was before they started.

We would ask: Why? Is there no way to keep our streams clear and clean? Can some pollute while others may not?

Gentlemen, we look to you and your technically trained men to make the proposals for the return of clean waters. We will help with the continued clamor it seems to take to get anything done.

We are leaving for the record a few of the many complaints we have received, and a copy of the May Rotarian with an article on clean water. You undoubtedly have the 10th annual report of the Pacific Marine Fisheries Commission as well as the "Clean Waters and You" of the Washington Pollution Control Commission. If you haven't, I can leave a copy of those.

CHAIRMAN STEIN: Are you leaving one document for the record?

MR. SCHENCK: I'll leave three for you.

CHAIRMAN STEIN: These will be marked Oregon Exhibits 4, 5 and 6.

...Whereupon, the documents referred to were marked Oregon Exhibits Nos. 4, 5 and 6, and such documents accompany the original transcript of the conference...

CHAIRMAN STEIN: Do you have anything more, Mr. Schenck?

MR. SCHENCK: That is all.

CHAIRMAN STEIN: Any comments from Washington, or from Oregon?

MR. MILLER: I have nothing.

MR. EVERTS: No, nothing.

CHAIRMAN STEIN: Thank you very much.

MR. EVERTS: Mr. Chairman, Mr. Bresee, Regional Vice President of the Oregon Wildlife Federation, has a statement which he wishes to file with the conference.

MR. BRESEE: Mr. Chairman and conferees, I am Harold Bresee, President of the Multnomah Anglers & Hunters Club, one of the oldest clubs in the State of Oregon. I am also the Regional Vice President of the Oregon Wildlife Federation in the Portland area.

Recognizing that pollution in our State is a condition that is getting worse day by day, the Oregon Wildlife Federation has made pollution abatement their number one program for the ensuing year.

We all know that the Willamette is a major contributor of pollution to the lower Columbia River system. While we grant that the Oregon Sanitary Authority has done much towards abatement, it is quite evident that they are fighting a losing battle. We have had water pollution control in Oregon since 1939. Yet, by their own progress report, 1957 was one of the worst years we have had. In the summer months of 1957, the Willamette River at Portland and the South Santiam at Lebanon, the dissolved oxygen content was less than the minimum required to support fish life. Of the pollution load, 1.8 per cent was raw sewage, 20.5 per cent was from sewage treatment plants, and 77.7 per cent was from industrial plants.

It is quite apparent that, while cities have much to do towards sewage treatment, some progress is being made with the help of the Federal Government, but industry, which is by far the major polluter, has not reduced their load in proportion. The complaints of fouled lines and boats from slime growth in the river are many, and yet are used by many other than fishermen. Boating for pleasure and water skiing has had a tremendous increase in the last few years. Swimming is perhaps the only recreation that has not increased in our rivers.

Mr. Spies of the Oregon State Sanitary Authority, at a meeting of the Milwaukie Rod and Gun Club, stated that there were only two places on the mainstem of the Willamette River safe enough for swimming, one at Corvallis, and the other above Springfield. John Borden, Clackamas County Sanitarian, in an article in the Oregonian, labeled the Willamette as dangerous for swimming.

It is a shame that, in Oregon where we have so much water, the people must drive a long way to find water clean enough to go swimming. As much as we could use another park, such as Rooster Rock, it would still have to be above Camas, Washington, to be clean enough for recreational use. Many of the standards of stream purity have been and are being violated. The Oregon Wildlife Federation will note with interest what transpires at this meeting, along with various other interested groups. You may be sure that we will continue to press for action to clean the waters in our State.

We wish to thank the Public Health Service for the opportunity of appearing before this conference, and we wish you every success.

CHAIRMAN STEIN: Thank you. Are there any questions?

MR. POSTON: I would like to ask one. It wasn't quite clear to me whether you were speaking of the Willamette or the Columbia, which is under discussion here.

MR. BRESEE: We speak of the Willamette as a contributing factor to the pollution to the lower Columbia.

MR. POSTON: Thank you.

CHAIRMAN STEIN: I'd like to make one comment just to make perfectly clear what the Federal Government's function and jurisdiction is. We are only concerned with interstate pollution, and that is pollution from one State which endangers the health or welfare of persons in other States.

Water use damages from the Willamette affecting people or alleged to be affecting people in Oregon is an intrastate problem and outside our jurisdiction here. Our function in that case is to provide technical aid and assistance to the State on request. However, if the Willamette does contribute to the pollution of the mainstem of the Columbia and that will affect the health or the welfare of people in Washington, then we would be concerned. I just wanted to make that very clear so that we understand the ground rules.

Thank you, sir.

MR. EVERTS: Is Mr. Stewart present?

MR. STEWART: Yes, sir.

MR. EVERTS: Do you have a statement to make or material to present?

MR. STEWART: Mr. Chairman, conferees, ladies and gentlemen, may I say my name is Henry Stewart. I am a member of the Interstate Pollution Abatement Committee, the same committee that Mr. Nelson represented a few moments ago. I am also a member of the Milwaukie Rod and Gun Club.

I have here a book of clippings, which I would like to present to the conference. They show the widespread public interest in the clean-up of our streams. There is nothing of a technical nature here. I present this on behalf of the committee to show that the interest in the clean water is not confined to sportsmen or commercial fishermen. It's a matter of concern to the general public.

CHAIRMAN STEIN: That may be labeled as Oregon Exhibit No. 7.

...Whereupon, the book of clippings was marked Oregon Exhibit No. 7, and such document accompanies the original transcript of the conference...

MR. STEWART: Thank you. I would also like to say that from the standpoint of the Willamette contribution to the Columbia River pollution, I have sports fished for chinook salmon in the Columbia for a number of years. I have found in the last two years particularly that the sphaerotilus load in the Willamette River downstream from Willamette Falls, Oregon City, is so severe that it's almost impossible to fish successfully for more than 15 or 20 minutes at a time. Your lines become greatly entangled with sphaerotilus and other material. I'm sure that that same material passes on to the Columbia and contributes greatly to the pollution load in the Columbia.

Thank you very much, Mr. Chairman.

CHAIRMAN STEIN: Thank you. Are there any comments from Washington?

MR. MILLER: Nothing.

CHAIRMAN STEIN: From Oregon?

MR. EVERTS: No, sir.

CHAIRMAN STEIN: Mr. Poston, do you have anything?

MR. POSTON: For clarity of the record, I would like to call Mr. Kittrell back to explain the reason why we are unable to evaluate the effect of the Willamette on the lower

Columbia.

MR. KITTRELL: As I brought out in my report, we have a limited amount of data showing that the slimes brought into the Willamette River tend to settle in the Portland harbor under normal stream flow conditions. As I also pointed out, at times of freshets, apparently some of these slimes are picked up from the bottom of the harbor or slimes from upstream are brought down and do enter the Columbia.

Our data, as I say, are relatively limited, and, as I pointed out, we do not believe they're adequate to assess the part played in the overall Columbia River problem by slimes from the Willamette.

CHAIRMAN STEIN: Thank you, Mr. Kittrell.

At this point, I think we would like to recess for lunch. Now, there may be some other people from Oregon who wish to be heard. If there are such, I would suggest that during the luncheon recess these folks get in touch with Mr. Everts, and he will call on them as soon as we reconvene after lunch.

We now stand recessed until 1:30.

...Whereupon, at 12:05 o'clock, p.m., a recess was taken until 1:30 o'clock, p.m., of the same day...

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AFTERNOON SESSION

...Whereupon, the Conference was resumed, pursuant to the taking of the recess, at 1:30 o'clock, p.m....

CHAIRMAN STEIN: The conference is reconvened.

Before we start, I would like to make a few announcements. So we won't put everyone into a prolonged stupor, we will continue until 4 o'clock, or until the conclusion of the Washington presentation, whichever comes first, and then take up again tomorrow morning.

One more point, I think for clarification of the record, I would like to say that the official water pollution control agency for Oregon is the Oregon Sanitary Authority.

Now, there have been several questions raised about the effect of participation in the conference by participants, who have been invited by the States to participate. I should like to say and let the record be very clear on this, that participation as an invited participant will not make anyone a party to the conference. Parties to this conference are the official State agencies and the Public Health Service. Nor will participation in the conference by anyone constitute a waiver of any of their rights relating to the substantive declarations made in the conference as to the jurisdiction of the Public Health Service or the States, or anyone else, in regard to the matters under consideration by the conference, as to the constitutionality of what we are doing, or any interpretations of law which may be made, or any conclusions of fact which may be drawn by the conferees.

I think that with that we can take up again with Mr. Everts and see if he has any more folks from Oregon to participate.

Mr. Everts.

MR. EVERTS: Mr. Chairman, I would like to present to the conferees Mr. Rex Childs of the Milwaukie Rod and Gun Club.

MR. CHILDS: I'm Rex Childs of the Pacific Building Materials, Dredge Superintendent, and Past President of Milwaukie Rod and Gun Club.

Mr. Chairman and conferees, I have some exhibits here I'd like to show. Here is a two months deposit of the sediment from the paper mill on an island 20 miles above the mouth of the Columbia. Now, there's acres of this to be seen up there. Now, this is practically all pulp, which is found in swifter water and doesn't have all of the stuff that the other has, and it all goes to the bottom in these big holes that are along the river, and it deposits in there until the warmer water comes, and then there is a fermenting and it bulges up and sometimes will jump a foot out of the ground -- out of the water before it settles, and there is air in that, and it floats, and then it sinks to the bottom in this form here and goes down and comes up again some other place, and down it goes, and that continues all summer.

...Several samples of the material were displayed...

MR. CHILDS: I live right in back of the Willamette and I've seen as much as a half an acre of that stuff on top of the water at one time in one big boil-up, and that goes at a time when they're not dumping in the Willamette, but it was dumped before the time that they should take this stuff to the mouth of the Willamette, where the Publishers do and that Crown Willamette dump in at a time when the oxygen content is high enough that they don't have to dump this stuff in their lagoon.

That's about all I have to say.

CHAIRMAN STEIN: Do you have any questions?

MR. MILLER: Nothing.

MR. POSTON: I have nothing.

MR. EVERTS: No questions.

CHAIRMAN STEIN: Thank you, Mr. Childs.

MR. EVERTS: Mr. Chairman, that is all of the people that I know of from Oregon who have requested time to make statements.

If there is anyone else present who I have overlooked, I wish you would make yourself known now.

...There was no response...

MR. EVERTS: If not, I would like the privilege of introducing into the conference record a letter from the State Game Commission, which is addressed to you, Mr. Stein, as Chairman, which reads as follows:

"The Oregon State Game Commission, as a result of its responsibility for the support of the fishery in the Columbia

River, as prosecuted by Oregon license holders, is vitally interested in any measure to maintain waters of purity necessary to sustain the game fishes of the river. Any pollution, which through its excessive use of oxygen and consequent killing of fish, or which may act as a repellant or deterrent to the movement of the anadromous species of fish, should be controlled.

"We respectfully request careful consideration of those agencies under whose care the control of pollution is vested."

This is signed by Clark Walsh, Assistant Director of the Game Commission, and P. W. Schneider, Director.

Before closing, I would like also to place into the record, Mr. Chairman, the fact that, as conferee for Oregon, we sent invitations for participation in this conference to some 26 agencies, organizations and groups. I have a list of those names here. I would like to file that, if I may, along with a copy of the letter which we addressed to them on this conference, and I would like to have a duplicate list prepared for you.

CHAIRMAN STEIN: Without objection, you would like to have this inserted at this point in the record, and not referred to as an exhibit?

MR. EVERTS: Yes, Mr. Chairman.

CHAIRMAN STEIN: Very well, that may be done.

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...Following is the invitation written by Mr. Curtiss M. Everts, Jr., Secretary, Oregon State Sanitary Authority, Portland, Oregon, under date of August 8, 1958, to the agencies, organizations and groups listed immediately after the letter proper...

"Dear____________________

"Pursuant to the provisions of P.L. 660 (84th Congress) the Surgeon General, United States Public Health Service, has called a conference to discuss the matter of interstate water pollution and water pollution control in the lower Columbia River downstream from Bonneville Dam. This conference will be held on September 10th and 11th in the auditorium of the Interior Building, 1001 N. E. Lloyd Blvd., Portland, Oregon, beginning at 9:00 a.m.

"You are invited to attend the conference and present any information or data which you may wish to offer concerning present and future water uses, occurrence and influences of pollution, or the present status of pollution control programs related to the lower Columbia River.

"For accuracy of the conference records, it is requested that any statement be submitted in triplicate and delivered to the conference chairman at the time of your appearance. An opportunity will be afforded for you to express your views verbally, if you so desire. Due to the anticipated number of participants at the conference, oral statements should be limited to the highlights of your presentation.

"For the sake of uniformity, presentations should be developed from any or all of the following:

"A. River uses
B. Significant waste discharges, their effects, and existing and planned control measures
C. Research and studies
D. Future requirements

"Related subjects of significance may also be included.

"It will be appreciated if you will advise me at your earliest convenience, but in no case later than August 25th, whether or not you desire to present information to the conference so that an appropriate time schedule for your appearance can be arranged.

"If you have any questions about the conference, please feel free to ask us for any further information you may desire."

...Following is list to whom invitations were issued by Mr. Everts to attend the conference...

Don Lane, Secretary
Water Resources Board
270 Finance Building
Salem, Oregon

R. A. Phair, Past Commodore
St. Helens Yacht Club
Box 463
St. Helens, Oregon

Mr. Isaiah Gellman
P. O. Box 1264
Portland 7, Oregon

Don Baker, Commodore
Tyee Yacht Club
2929 N. E. Marine Drive
Portland, Oregon

Charles S. Collins, President
Oregon Wildlife Federation
c/o Douglas County Parks Department
Roseburg, Oregon

B. C. Buck, Commodore
Columbia River Yacht Club
7919 N. E. Marine Drive
Portland, Oregon

Nathan A. Boody, Commissioner
City of Portland
City Hall
Portland, Oregon

A.J.Kreft, M.D., President
Oregon Division
Izaak Walton League
Pittock Block
Portland, Oregon

C. C. Schenck, Secretary
Interlocking Committee Washington-Oregon
700 N. E. Broadway
Portland, Oregon

Sam Robinson, President
Publishers' Paper Company
P. O. Box 551
Oregon City, Oregon

A. A. Dupuis, Manager
Crown-Zellerbach Corporation
St. Helens, Oregon

Walter Lloyd, Manager
Kaiser Gypsum Company
5931 East Marginal Way
Seattle, Washington

Albert M. Day, Director
State Fish Commission
307 State Office Building
Portland, Oregon

Richard A. Bain, Executive Secretary
Committee on Natural Resources
Capitol Building
Salem, Oregon

Don P. Ross, Commodore
Rose City Yacht Club
7303 N. E. Marine Drive
Portland, Oregon

Alton H. Alexander, Commodore
Portland Yacht Club
1241 N. E. Marine Drive
Portland, Oregon

Lewis A. Stanley
State Engineer
State Office Building
Salem, Oregon

C. H. Armstrong, Superintendent
State Parks Division
State Highway Building
Salem, Oregon

William Weatherholm, Executive Secretary
Columbia River Fishermen's Protective Union
322 - 10th Street
Astoria, Oregon

James Sellers, President
Columbia River Packers Association
Astoria, Oregon

P. W. Schneider, Director
State Game Commission
1634 S. W. Alder
Portland, Oregon

Honorable Gordon Swan, Mayor
City of Gresham
Court House
Gresham, Oregon

Honorable S. Heinie Heumann, Mayor
City of St. Helens
Court House
St. Helens, Oregon

Honorable M. K. Tolleshaug, Mayor
City of Rainier
Court House
Rainier, Oregon

Honorable J. D. Puzey, Mayor
City of Clatskanie
Clatskanie, Oregon

Reynolds Metals Company
Troutdale, Oregon
Attention: Mr. McIntyre

---oOo---

MR. EVERTS: That concludes the participants from Oregon, Mr. Chairman.

CHAIRMAN STEIN: Thank you, Mr. Everts, for the excellent presentation.

At this point, we would like to proceed to the next item on the agenda and call on Mr. Harold E. Miller, Director, Washington Pollution Control Commission, for statements on water pollution and water pollution control in the Lower Columbia River for the State of Washington.

Mr. Miller.

MR. MILLER: With your permission, Mr. Chairman, I would like to introduce the Chairman of the Washington Pollution Control Commission, Mr. Earl Coe, who is sitting beside me.

The Washington Pollution Control Commission is happy to participate in this conference. We believe in this kind of a meeting to get together and discuss our problems, and we are certain that the information that is developing here will assist, not only our Commission, but our counterpart in the State of Oregon in the development of a water pollution -- an effective water pollution control program between the two States as it affects the Columbia River.

I know that you've ruled on this matter, Mr. Chairman, and undoubtedly your ruling is correct, but, for the record, I would like to state that the Washington Pollution Control Commission had requested the Governor of Oregon to conduct this conference under Section 2 of Public Law 660. It was the intent of our commission, when we concurred in the request of Oregon for a conference of this kind, that we have exactly the type of meeting that we're having here today, to develop facts on which we could base programs and make progress in this field.

The Governor of Washington strongly endorses this approach and concurs in the stand of the Governor of Oregon in this regard.

As our contribution of our agency to the conference, we have prepared a report which will be presented by two people on our staff. The first speaker will be Mr. Charles Gibbs, District Engineer of the area that we're talking about here today.

Mr. Gibbs.

MR. GIBBS: Thank you, Mr. Miller.

Mr. Chairman, conferees, ladies and gentlemen:

Mr. Kittrell has already described the area covered by this conference. So, I don't think we need to go over this again except to say that we extended our coverage to the mouth of the river. The important river uses have been discussed already and will be emphasized by participants to follow. So, I don't think we need to go over this again.

My portion of the statement will commence with that entitled "Significant Waste Discharges and Existing and Proposed Control Measures". First, we will discuss municipal waste discharges.

A table prepared for the written statement indicates the sewered populations, average flow, and treatment provided at each of the nine communities located on or near the river. The total sewered population for the nine communities is estimated to be 71,825 persons, of which 64,875, or 90 per cent, are served by primary treatment and disinfection facilities. The remaining wastes are discharged without treatment.

The largest volume of untreated municipal sewage is discharged from Vancouver through three outfalls. One outfall, serving 950 persons, is scheduled for interception this year. The second, serving 2,000 persons, will be intercepted in 1959. The third and largest source will not be eliminated until new sewers are constructed to reduce an excessive infiltration load. Although some work is scheduled for 1959, no time schedule has been established for complete correction.

The other three sources of untreated sewage are Ridgefield, Cathlamet and Ilwaco. Ridgefield is planning a bond election this year and, should the vote be favorable, this source of raw sewage will be eliminated in 1959. Cathlamet officials recognize the necessity for sewage treatment, but, as yet, the project has not progressed beyond the talking stage. Ilwaco has opened bids for construction of their primary plant and, upon acceptance by the town of the bids and approval of the United States Public Health Service under Public Law 660, the work will proceed.

Of major importance when considering the bacterial contamination of the river is the fact that most of the municipalities have combined sewer systems. During the winter months, all of the existing plants are overloaded and/or by-passing, which results in inadequately treated sewage discharged to the river. As in all such cases, the separation of storm water is exceedingly costly, which necessitates a lengthy period of correction.

Since the present practice is to prohibit combined sewage in new construction and with the program of eliminating existing combined systems, it is expected that the problem of bacterial contamination of the Columbia River from overloaded treatment plants will be steadily lessened.

Other sources of bacterial contamination are the sanitary wastes from the industries bordering the river. The largest volume of untreated sewage from this source is the discharge from the industrial area of the Port of Vancouver, where up to 2,500 persons can be employed at one time.

Six other industries employing large numbers of persons and not connected to a municipal sewage treatment plant have constructed their own primary plants and have provided disinfection of the effluent. The following is a list of those industries:

Pendleton Woolen Mills, Washougal
Aluminum Company of America, Vancouver
Longview Fibre Company, Long Bell Division of the International Paper Company, the Lumber and Pulp Divisions of the Weyerhaeuser Timber Company, and the Reynolds Metals Company, all at Longview.

The industries concentrated in the Port of Vancouver area are engaged in preliminary planning for collection and disposal of their sanitary wastes, which, when completed, will eliminate the last significant discharge of these wastes from the industries to the river.

Next, we will consider industrial waste discharges. Another table prepared for the written statement lists all of the separate industrial waste discharges on the Columbia River between Bonneville and the mouth. Listed for each industry are waste characteristics, flow, treatment, and nutrient content.

The nutrient content is listed as pounds per day of soluble carbohydrates, or sugars, since it is these sugars that under proper conditions promote the growth of the bacterial slime - sphaerotilus.

Six industrial discharges containing nutrient substances are considered to be of prime importance. These are Crown Zellerbach in Camas, Columbia River Paper Mills, Washington Canners, and California Packing Corporation, all in Vancouver, and the Weyerhaeuser Timber Company Pulp Division and the Longview Fibre Company, both at Longview.

It is important to note that the four pulp mills contribute 90 per cent of the 251,000 pounds per day of nutrients discharged by the six industries.

The two Vancouver canneries, although seasonal in operation, contribute 10 per cent of the total nutrients during their two to three month pear canning season.

I would like to read the following list which summarizes the nutrient contribution from each of the six industries:

Crown Zellerbach discharges approximately 123,000 pounds per day, which is 49 per cent of the total. Columbia River Paper Mills discharges approximately 52,000 pounds per day, which is 21 per cent. Weyerhaeuser Timber Company, 45,000 pounds, 18 per cent; California Packing Corporation, 18,000 pounds, 7 per cent; Washington Canners Co-op, 8,500 pounds, 3 per cent; and Longview Fibre Company, 4,700 pounds, 2 per cent.

The State of Washington in 1955 enacted a law regulating the discharge of waste material into the waters of the State and providing for the issuance of waste discharge permits. The Pollution Control Commission has the authority to specify conditions necessary to avoid undue pollution in each permit under which waste material may be disposed of by the permittee. Permits may be temporary or permanent, but are not valid for more than five years from the date of issuance.

It has been the policy of the Pollution Control Commission to issue permanent permits to industries utilizing known and reasonable methods for reducing the pollutional content of their wastes, notwithstanding the fact that the reduction being achieved may not eliminate the sphaerotilus problem. Under this policy, of the 54 industries on the river, 46 or 85 per cent are operating under permanent permits. Four of the remaining eight industries, all of whom are operating on temporary permits, are involved in the aforementioned problem of nutrients and sphaerotilus and will continue to operate on temporary permits pending determination of the significance of their discharge to the sphaerotilus problem and pending the determination of the feasibility of treatment processes. The last four industries are involved in problems other than sphaerotilus and will receive permanent permits as their individual cases dictate.

In the summer of 1955, the Washington Pollution Control Commission, through its Director and Chief Engineer, urged that the Crown Zellerbach Corporation suggest a plan to eliminate the major portion of the sulfite liquor solids discharged from the Camas mill. In August of that year, J. D. Zellerbach, President of the corporation, indicated an interest in solving the problem and suggested a study be made to guarantee that the capital expenditures achieve the desired results.

In September, 1955, the Commission accepted the proposal and later named Dr. E. J. Ordal, microbiologist from the University of Washington, to serve as senior scientific advisor in the study.

Several possible solutions to the sphaerotilus problem have been investigated during the study and are summarized as follows:

No. 1. Soluble Base Pulping - There are a number of soluble base pulping processes presently being used which permit the evaporation and burning of the waste liquor. Soda base pulping and the familiar M_gO process are examples of soluble base pulping processes. There are two sources of waste from these processes: (1) the weak wash water and (2) the evaporator condensates. These wastes, in conjunction with the other pulping effluents, may be of sufficient magnitude to support heavy slime growth.

No. 2. Heat Hydrolysis - Heat Hydrolysis is a process by which the digester strength liquor is heated at temperatures of 250 degrees Centigrade and at high pressures. The slime reduction, which can be expected by this method, will be about 50 per cent.

No. 3. Changing the Waste Distribution Pattern -- Observations of conditions in the Columbia River indicate that major sphaerotilus growing areas may be the log rafts along Lady Island and the Washington shore. By altering the present effluent discharge pattern from the Camas mill's deep water diffuser line, it may be possible to substantially reduce sphaerotilus growth. To accomplish this, it would be necessary to eliminate the diffuser aspects and discharge all effluent at the end of the present submerged line. This method might eliminate waste liquors that presently contact the log rafts along Lady Island and the Washington shore and would demonstrate whether or not this sphaerotilus growing area appreciably affects conditions downstream.

No. 4. Intermittent Discharge - Intermittent discharge or regulated discharge has been proposed as a possible solution. This method consists of storing the waste and the discharging over a short interval. Since bacteria feed continuously and require a continuous source of food, elimination of food throughout the major portion of the growth phase might substantially reduce the bacterial numbers.

Of primary concern in the consideration of this program is the waste concentrations which would result below the mill.

No. 5. Yeast fermentation - In this process, the steam stripped waste is aerated in a fermentor in the presence of yeast cells which utilize sugars. From experimentation, it has been concluded that the overall slime reduction from this process would be about 56 per cent.

No. 6. Bacterial Fermentation - This process is similar to the yeast fermentation process, the only difference being that bacteria are continuously recycled to maintain high concentrations of cells in the fermentor. B.O.D. reductions of 80 to 95 per cent are possible. Effluents from this process did not, when assayed, support slime growth.

This fermentation process has been very effective when using ammonia base liquor, but, when using the calcium base liquor from Camas mill of Crown Zellerbach, difficulty is experienced in collection of bacterial cells. In accordance with Dr. Ordal's suggestions, laboratory work is being continued on an intensified scale.

Another method proposed is that of river controls. It is known that the growing sphaerotilus is swept downstream during periods of river freshets and, for this reason, the possibility of cleansing the growing areas with a release of impounded water from the many upstream hydroelectric plants just prior to the fishing seasons has been suggested.

The feasibility of this solution would have to be investigated with the agencies controlling the dams.

This concludes the portion of our statement dealing with waste discharges and control programs.

Mr. Miller will now call on another member of our staff to discuss the effects of waste discharges.

CHAIRMAN STEIN: Mr. Miller, do you plan on putting in the full report for the record?

MR. MILLER: We intend to do that.

CHAIRMAN STEIN: We will have this marked as Washington Exhibit No. 1 at this point.

...Whereupon, the document referred to was marked as Washington Exhibit No. 1, and such document accompanies the original transcript of the conference...

CHAIRMAN STEIN: Are there any questions?

MR. MILLER: No questions.

MR. EVERTS: I have nothing.

MR. POSTON: No questions.

MR. MILLER: Since about 1943, there have been a number of researches conducted by the Washington Commission and projects conducted jointly by the Oregon and Washington Commissions, and jointly by the Oregon and Washington Commissions and the United States Public Health Service.

For a brief review of these research problems and the refinement of those problems, I would like to call on Mr. Charles Peterson.

MR. PETERSON: Mr. Chairman and conferees:

Several intensive studies have been made on the lower Columbia River pertaining primarily to the sphaerotilus problem and, to a lesser degree, contamination resulting from domestic sewage discharges. Today, I will briefly summarize those investigations which are most pertinent to the problem today.

The Washington State Pollution Commission and the Oregon State Sanitary Authority undertook a joint investigation of the sphaerotilus problem commencing in late 1940 and terminating in early 1942. Significant conclusions of the study, which is officially entitled "Report on Investigation of Pollution in the Lower Columbia River", but which has come to be known and referred to as the Lincoln-Foster report, were as follows:

The slime growth, which was present in certain areas of the lower Columbia River and seriously handicapped fishing operations, was identified as a strain or strains of sphaerotilus, a filamentous sheath-forming fungus.

Sphaerotilus occurred in greatest abundance within Camas Slough and near and below the pulp mill just west of Longview. The slime also grew attached to objects along the Washington bank of the river from the mouth of Camas Slough to a point almost opposite the mouth of the Willamette River.

Waste sulfite liquor and specifically the carbohydrates contained in the waste liquor was the cause of the growth of sphaerotilus in the Columbia River.

On the lower Columbia River, sphaerotilus grew only in places where the concentration of sulfite waste liquor was 50 parts per million or greater.

This last statement is especially significant because, based on that, all of the control measures and correction procedures on the Columbia River took place in the following years.

During the summer of 1951, the Pollution Control Commission conducted a survey of the Columbia River to determine effects of both industrial waste and domestic sewage discharges. Since the Lincoln-Foster report of 1943, several changes had taken place: Sewage treatment facilities had been constructed by the cities of Vancouver, Kelso, Ryderwood, Woodland and Morton; The Weyerhaeuser Timber Company at Longview had changed its pulping process from calcium base to magnesia base, which, of course, entails recovery of cooking liquors; the Longview Fibre kraft mill at Longview had constructed a diffuser type outfall; and the Crown Zellerbach mill at Camas had also installed a diffuser outfall for strong liquor disposal.

At the time of the 1951 survey, however, the Crown Zellerbach outfall had developed a break, and all wastes were being discharged to Camas Slough. Because the pipeline break created a condition not normally in existence, the survey area was limited to that section of the river below the Interstate Bridge.

Pertinent results of the survey were as follows:

Excessive coliform concentrations were present in Columbia River waters due to discharges of raw sewage from Camas, partially treated sewage from the Vancouver area, and raw sewage from Longview.

The waters of the Cowlitz River were of fairly good bacteriological quality upstream from Castle Rock.

The most profuse growth of sphaerotilus in the survey area was found to exist just downstream from the Columbia River Paper Mills, Incorporated, pulp mill at Vancouver. Concentrations of sulfite waste liquor in the Vancouver area were found to average between 60 and 550 parts per million.

Extensive growths of sphaerotilus were also observed below the Weyerhaeuser Timber Company outfall at Longview.

Subsequent to the investigation conducted in 1951, additional significant changes took place in regards to industrial waste disposal. The Weyerhaeuser Timber Company completed installation of a diffuser outfall for their Longview operation; the Columbia River Paper Mills at Vancouver had installed a retractable diffuser line; and the diffuser at the Crown Zellerbach operation at Camas had been repaired and was operating satisfactorily.

To determine the effectiveness of such diffusers, a check survey was conducted in 1954 by the Pollution Control Commission. Conclusions of primary importance were as follows:

River conditions immediately below Camas had improved considerably as regards sulfite waste liquor concentrations since the diffuser line had been put into operation.

Survey results indicated that concentrations of over 50 parts per million existed in the river from a point approximately 450 yards below the outfall to a point just below Lady Island.

The installation of the diffuser discharge line at the Columbia River Paper Mills resulted in noticeable reduction in liquor concentrations in Columbia River waters below Vancouver. In 1951, the average liquor concentrations at the railroad bridge were 120 parts per million, and concentrations of over 500 parts per million had been detected immediately below the outfall location. In 1954, maximum concentrations detected varied between 50 and 60 parts per million.

Theoretical calculations and actual survey results indicated a background concentration of 15 to 20 parts per million apparent sulfite waste liquor in the Columbia River immediately above the Weyerhaeuser outfall at Longview.

The installation of the Weyerhaeuser diffuser line had improved water quality conditions considerably in the Columbia

River, primarily along the Washington shoreline just below the former outfall location. Although concentrations up to 44 parts per million were obtained, there was little evidence of the sphaerotilus growths that formerly were present in abundance.

During portions of the years 1955, 1956, and 1957, a joint survey was conducted in the lower Columbia River area by the U. S. Public Health Service, the Oregon State Sanitary Authority and the Washington Pollution Control Commission. The general objectives of the survey were to locate the areas of active sphaerotilus growth; to develop methods to correlate the areas of growth with various concentrations of nutrients and certain physical factors; and to determine the effect of sphaerotilus production in the lower Willamette River upon the Columbia River. This particular report is presently in the draft stage.

In 1955, after a particularly troublesome slime situation, the Director of the Pollution Control Commission asked the Crown Zellerbach Corporation to investigate possible solutions to alleviate the problem. J. D. Zellerbach, President of the corporation, agreed to a study of the slime problem and requested that the Commission direct the research activities. Dr. E. J. Ordal, microbiologist from the University of Washington, was selected as Senior Scientific Advisor, and, in addition, various members of the Commission staff, as well as industry personnel, have assisted in the survey and research activities. Except for Commission personnel salaries, all expenses of the survey were borne by Crown Zellerbach.

In 1958, a progress report was published covering the first two years of these intensive limnological and laboratory studies. Major findings in these pertaining to the river were as follows:

Laboratory and stream studies showed that slime growth occurs at concentrations of sulfite waste liquor well below 50 parts per million.

Phosphorus proved to be an important nutrient factor in slime growth; low concentrations of this element in late summer and early fall may be a limiting factor.

Laboratory studies demonstrated that velocities over 0.5 feet per second are necessary for optimum slime growth.

As Mr. Gibbs mentioned previously, of the various processes he investigated, the bacterial fermentation process proved to be the most effective for reducing the slime potential of sulfite waste liquor.

I might say, however, there are some inherent problems developed in that process.

During the summer of 1958, the Washington Pollution Control Commission conducted a limited survey of the lower Columbia River and some of its principal tributaries. The primary purpose of the survey was to obtain current bacteriological data and sulfite waste liquor concentrations for comparison with results primarily of the 1951 survey. This comparison forms the basis of the next section of our statement, namely, waste effects in the lower Columbia River.

First, I would like to discuss the bacteriological characteristics. Since the Pollution Control Commission survey of 1951, the domestic sewage problem on the lower Columbia River had improved considerably. Sewage treatment facilities had been constructed by the cities of Winlock, Castle Rock, Camas and Longview, and disinfection facilities had been put into operation at the Vancouver sewage treatment plant. In addition, essentially all of the major industries on the river had either installed adequate domestic sewage treatment facilities of their own, or had connected their sanitary sewers to municipal sewerage systems.

During the month of August, 1958, the Pollution Control Commission conducted a limited bacteriological survey on the Columbia and its tributaries, using the same sampling stations established for the 1951 survey. Although the data collected in 1958 is scanty admittedly, it does serve as a comparison with similar data obtained in 1951.

Attached to our statement are tables listing all data obtained in 1958, together with the average values obtained in 1951. For the purpose of our verbal statement at this time, however, I will just summarize the significant changes.

In the overall evaluation of the area surveyed, which extended from above Camas to a point one-half mile below Stella, the bacteriological water quality during the August, 1958, survey demonstrated significant improvement over that of 1951. These data were essentially from six widely spaced stations selected to give a broad view of the bacteriological picture of the Columbia, rather than pinpointing any specific area. The 1958 results for the Cowlitz River system, which is an important tributary system to the Columbia on the Washington side, indicated that this river was in relatively excellent condition and demonstrated the beneficial effects of the new sewage treatment plants at Winlock and Castle Rock.

Bacteriological data obtained in 1958 for the Vancouver area demonstrates a definite improvement in bacteriological water quality in the immediate Vancouver waterfront area, but also indicates the influence of unchlorinated effluent from the treatment facilities serving the city of Portland. Data collected at the mouth of the Willamette River indicated a moderately contaminated condition with both, for example, with samples yielding an average MPN of 24,000.

Results of bacteriological sampling in the Longview-Kelso area in 1958 showed the same general improvement over the 1951 results along the immediate Washington shoreline. However, the results of the sampling station at the Interstate Bridge location, which was a station set up across the entire width of the river, demonstrated a definite overall increase in MPN. The actual cause for the increase was not determined by survey procedure, but may possibly have been due to unchlorinated sewage discharges from the cities upriver, such as Portland, St. Helens and Rainier. Survey observations have shown that the waters fronting the Longview area are primarily Cowlitz River waters and hence this section is not appreciably affected by the overall bacteriological quality of the Columbia River.

Insofar as physical and chemical characteristics are concerned, the primary problem in the lower Columbia River pertains to slime production, and, since pulp mill wastes are the major contributor of nutrients, which promote slime growth, our statement at this time will be limited to a discussion of sulfite waste liquor concentrations detected at the various stations in the survey area. Again, as in the case of bacteriological data, my discussion will be limited to a summary of significant changes. All data is included in the attached tables to the statement.

The first area investigated in 1958 was in the vicinity of Vancouver. Here the data indicated that the diffuser outfall serving the Columbia River Paper Mills was very effective in diluting the waste liquor. The highest concentrations detected were in the 50 to 60 parts per million range, as compared with average values of 300 to 500 parts per million detected in 1951. However, it should also be noted that all concentrations determined in 1958 below this particular pulp mill were sufficient to promote the growth of sphaerotilus. This is according to recent information obtained that indicates that 15 to 20 parts per million are now sufficient to support growth.

Sulfite waste liquor concentrations for the Longview area are reported as "apparent" sulfite waste liquor concentrations. These values are reported thusly because they represent a combination of sulfite waste liquor from the Camas-Vancouver area, and Kraft wastes and M_gO bleach wastes from the Longview area. Results obtained just above the confluence of the Cowlitz River indicates that the Columbia River at this point had a background sulfite waste liquor concentration of 20 to 25 parts per million as it entered the Longview area. However, it can be presumed that the wood sugars in the liquor had been at least partly and possibly wholly utilized by bacterial action by this time. Consequently, the values indicated for the rest of the stations in the Longview area do not necessarily give an accurate indication of the amount of wood sugars present as nutrients.

We obtained some high values just below the Longview Fibre outfall during this portion of the survey. These were due primarily to the fact that the outfall had suffered a break, one that has since been repaired. High values were also obtained near the shore and immediately below the diffuser outfall of the Weyerhaeuser Timber Company pulp mill. These concentrations that were detected at this particular time were sufficiently high to support growths of sphaerotilus in at least the immediate vicinity.

It should be stated here, however, that, based on the Lincoln-Foster studies, the mills during the period of 1950 to 1953 were requested to reduce sulfite waste liquor concentrations in the receiving waters to below 50 parts per million, and the mills have essentially met this requirement.

Insofar as biological considerations are concerned, I would like to repeat that the primary effect of industrial waste discharges to the lower Columbia River is the resulting growths of sphaerotilus. It is quite apparent that a problem exists, especially pertaining to commercial and sports fishing. The effects of these slime growths have already been well discussed. Consequently, I will not repeat the reported areas of growth, the effects of freshets, the effects on fishing operations, and so forth.

I would like to make this statement in concluding, however. The recent joint studies by the U. S. Public Health Service and the States of Oregon and Washington were undertaken for the purpose of providing current and definitive information on this particular problem. The report of these studies, together with other research in progress, should provide a sound basis for the development of a joint program of action by the pollution control authorities for the two States.

A summary of our statement at this hearing is as follows, and I will summarize Mr. Gibbs' presentation as well as my own.

The Columbia River has a multiplicity of uses, the more important ones being industrial water supply, sport fishing, boating, commercial fishing, navigation, and waste assimilation.

The municipal sewage treatment program followed by the State of Washington has brought about the construction of primary sewage treatment plants with disinfection facilities to serve 90 per cent of the sewered population adjacent to the lower river. Construction planned for the next year will bring this total to 96 per cent.

Of the 54 industries located adjacent to the lower river, 46, or 85 per cent, are operating under permanent waste discharge permits, indicating that they are utilizing known and reasonable methods of pollution abatement.

Six industries are considered to be contributing a significant quantity of nutrients to the river. These are as follows: Crown Zellerbach in Camas, Columbia River Paper Mills, Washington Canners, and California Packing Corporation, all of Vancouver, and Weyerhaeuser Timber Company and Longview Fibre Company in Longview. The daily contribution of the six industries is 251,200 pounds of available sugars, of which 90 per cent is discharged by the four pulp mills.

Much effort has been expended in studying treatment processes to reduce the nutrient content of pulp mill wastes. The most promising process studied to date is that of bacterial fermentation. Additional study is under way to eliminate some of the problems encountered thus far.

Several intensive surveys and research studies have been made on the lower Columbia in regards to the sphaerotilus problem and to the contamination resulting from domestic sewage discharge.

Early findings indicated that the slime growths appeared only when concentrations of liquor were 50 parts per million or over, and original requirements of the pulp industry were based on that assumption. Subsequent studies have shown that at the present time slime growths are supported adequately in concentrations of 15 to 20 parts per million at least in some places.

In 1951, it was determined that excessive coliform concentrations were present in Columbia River waters due to the raw sewage discharges. A survey of the slime problem at that time indicated profuse growths below Vancouver and below the Weyerhaeuser Timber Company outfall at Longview.

In 1954, a survey by the Pollution Control Commission demonstrated that the diffusion of wastes from the four pulp mills on the river resulted in a general reduction of the sulfite waste liquor concentrations detected in previous surveys.

A joint Federal-State survey was made in 1955 through 1957 for the purpose of locating the principal slime growing areas in the lower Columbia River system. The report of this study is presently in preparation.

In 1958, a Pollution Control Commission survey demonstrated definite improvement in the bacteriological water quality of the Cowlitz River and of the Columbia River below Camas and in the vicinities of Vancouver and Longview.

CHAIRMAN STEIN: Would you mind waiting for some questions?

MR. MILLER: We have made four conclusions in this report. Number 1, considerable progress has been made by Washington municipalities and industries in reducing the pollution loading in the lower Columbia River.

Number 2, the principal problem remaining to be resolved is that of slime growths of sphaerotilus resulting from nutrients contained in industrial waste discharges.

Number 3, the forthcoming report of the recent joint investigation of the slime problem, coupled with research presently in progress, should serve as a sound basis for the development of a program of action by the States of Washington and Oregon.

Number 4, a joint meeting of the pollution control authorities of the States of Oregon and Washington should be held as soon as practicable after receipt of the transcript of this conference for the purpose of expediting a mutual and beneficial program with respect to pollution problems in the lower Columbia River.

That is the completion of our statement.

CHAIRMAN STEIN: Thank you, Mr. Miller. Mr. Everts, do you have any questions or comments?

MR. EVERTS: No, sir.

MR. POSTON: I have none.

CHAIRMAN STEIN: Mr. Peterson, I'd like to ask one. In dealing with the industries on the river, the 54 industries, you pointed out that 46, or 85 per cent, are operating under permanent permits. Then you specified six industries, Crown Zellerbach at Camas, Columbia River Paper Mills, Washington Canners and California Packing Corporation all of Vancouver, and the Weyerhaeuser Timber Company and the Longview Fibre Company at Longview, and you did not mention permanency.

Do these people have discharge permits too?

MR. PETERSON: They either have permanent waste discharge permits or temporary waste discharge permits.

CHAIRMAN STEIN: Well, do you review these permits periodically if they're permanent?

MR. PETERSON: Yes.

CHAIRMAN STEIN: Are they reviewed every year?

MR. PETERSON: There is not a particular time schedule.

CHAIRMAN STEIN: How about the temporary? Do you care to distinguish there? What I'm trying to get at is the distinguishing feature between the temporary and permanent permit. Let me recapitulate. As I understand it, all these plants, all 54 industries, do have permits.

MR. PETERSON: Mr. Stein, I would prefer that either Mr. Gibbs or our Director answer the questions pertaining to the permit system.

MR. MILLER: I think Mr. Gibbs is more familiar with it.

CHAIRMAN STEIN: Did you want me to repeat the question, Mr. Gibbs? The 54 industries located adjacent to the river, all of these industries have permits?

MR. GIBBS: They do.

CHAIRMAN STEIN: How many of these industries have temporary permits?

MR. GIBBS: Eight of the industries have temporary permits.

CHAIRMAN STEIN: What is your procedure as to temporary permits? What I'm getting at is: Do you review them periodically, and, if so, how often and what type of review do you give them before you issue another temporary permit?

MR. GIBBS: Another temporary? First, let me say the difference between a permanent and temporary permit is as it is described in our statement. Permanent permits are issued to industries who are utilizing known and reasonable methods of pollution abatement.

Those industries, who are not as yet utilizing methods, are issued a temporary permit, normally for one year.

CHAIRMAN STEIN: Well, what happens at the end of the year when the temporary permit expires? I'm trying to get the procedure of what you do.

MR. MILLER: The temporary permit, Mr. Chairman, is utilized as a means of, No. 1, of course, the law requires that an industry have a permit. So, the temporary permit is utilized as a means of providing a permit with the condition that the industry has agreed to an order to qualify permanently for a permit.

Now, the length of time involved under a temporary permit would depend on how long it takes to develop methods in order to qualify for a permanent permit, and it will vary in many industries. In some instances, at least, industries have had extensions of temporary permits and probably will continue to have them until they resolve their problems. There are a lot of complications in it.

CHAIRMAN STEIN: That's fine. I was just trying to understand the situation. Do I understand then that these industries, which do have temporary permits, get an automatic review at the end of each year?

MR. MILLER: The temporary permit is issued for a specific period of time, and 60 days before the time expires, the industry is required to apply for a new permit and specify what progress has been made, and then negotiations begin on the either permanent or another temporary permit, depending on the conditions.

It's merely an instrument or a method or a mechanism of moving toward a permanent permit.

CHAIRMAN STEIN: One more question: Is there any specific time that they issue a temporary permit for? Is that at times longer than a year, or evidently there's a date certain involved in these, is that right?

MR. MILLER: There is a date certain. We issue a temporary permit for as short a period as 60 days. I can recall at the moment some of them. I would have to ask a question because I'm not too long-standing with the organization.

What is the longest single period of time that we have issued temporary permits for?

MR. GIBBS: The longest one I can recall is two years.

MR. MILLER: One single temporary permit had a two year time limit on it. Now, this was undoubtedly a case that a program had been developed where it was anticipated it would take two years to move in and get it taken care of.

CHAIRMAN STEIN: Thank you. I have no further questions

Do you want to proceed, Mr. Miller?

MR. MILLER: In preparation for this conference, we wrote to 40 individuals and agencies interested in the Washington side of this problem. We received, on the basis of those 40 invitations to participate, seven written replies, indicating that a statement would be made at the time of the conference, and a different statement presented for the record. I understand that there are several people in the audience who did not notify us that they intended to make a statement, but would like to make one, and they will have an opportunity as soon as the prepared statements have been read.

I would like to call first on our Washington Department of Fisheries.

MR. HOLLAND: Mr. Chairman, conferees, ladies and gentlemen, my name is Gilbert Holland, with the Washington Department of Fisheries.

This statement has been prepared in part by Mr. H. O. Wendler, who is in charge of our Columbia River station at Vancouver. I will not read it verbatim since an item or two has already been covered specifically in previous papers already given. However, copies of the statement will be provided.

CHAIRMAN STEIN: May we label that Washington Exhibit No. 2, please?

...Thereupon the document referred to was marked Washington Exhibit No. 2, and such document accompanies the original transcript of the conference...

MR. HOLLAND: Attention has been focused rather heavily on the effects of slime fungus on commercial fishing nets and, in some cases, on the lines of sportsmen fishing in the Columbia River below Camas. However, relatively little has been said about the effects of waste liquor or its apparent by-product, slime fungus, on certain marginal species of anadromous fish inhabiting the Columbia River. These are the shad and the smelt. Both have considerable commercial and recreational value during the time they are present in the river and during certain periods of their life history may be extremely vulnerable to polluted waters.

Shad was first introduced from the eastern United States in the 1870's and 80's. Because the environment in the Columbia River was eminently suitable, shad had become firmly established in this system by the early 1900's. The Columbia River is presently one of the major shad producing rivers in North America. The fishery on this species has been, for the most part, incidental and supplemental to the more lucrative fisheries, the lucrative salmon fisheries, since the shad run coincides with the blueback salmon run which has a higher market value. Catch statistics are not always a reliable measure of the abundance of these species. In the early days, only roe shad were in demand. The buck shad had no value and were discarded. Since 1953, however, reported landings have to some extent been a measure of the abundance of roe shad.

Major shad spawning areas in the Columbia River system are: Youngs Bay near Astoria, Willamette Slough, Camas-Washougal Reef, Mt. Pleasant, and Hamilton Slough. I would like to point out these areas. (Indicating on map) Youngs Bay is near Astoria, Willamette Slough near the mouth of the Willamette River, the Camas-Washougal area, Mt. Pleasant near Washougal, and Hamilton Slough near Bonneville. It has been estimated by the Department biologists that the Camas-Washougal spawning ground for shad may produce as high as 50 per cent of the total Columbia River run.

Although the total annual shad catch in the Columbia River from 1940 to 1957 has exceeded 500,000 pounds, certain shad-producing areas have shown a decline in landings since 1945. Part of this decline has been due to changes in season and in fishing areas. Based upon the estimates prepared by another fisheries agency, the Oregon Fish Commission, and submitted to the members of the United States Senate, the annual average first wholesale value of shad on the Columbia River equalled $170,000 during the years 1938 to 1952. Nearly 100,000 pounds of shad annually are taken from the Camas-Washougal area of the Columbia River. Most of this catch is taken during the shad-only season that normally commences a week or more prior to the regular summer salmon season. In addition, shad are taken on hook and line in various areas of the Columbia River.

In 1941, Cheyne observed the effects of different concentrations of sulfite waste liquor on the hatching of Columbia River shad eggs obtained from spawning fish in Camas Slough. He used three different concentrations, 46.3 parts per million, 98.5 parts per million, and 168.3 parts per million. From his data, it appeared that the greatest mortality on shad eggs occurred at 98.5 parts per million. He further noted that in the three test jars containing sulfite waste liquor a filamentous organism appeared. This organism proved to be sphaerotilus, the same filamentous organism which is present in the Columbia River where sulfite waste liquor is found in certain concentrations. Sphaerotilus appeared most abundant in the test jars containing 98.5 parts per million of sulfite waste liquor where it was observed attached to the eggs and also loose filaments were seen to be lodged in the gills of newly-hatched fry. This caused death by suffocation, as their gill covers became extended. This condition was present in all three test jars, but was most prevalent at the aforementioned concentration. Cheyne also noted that, as the concentration of sulfite waste liquor increased, the incubation period increased.

Shad eggs after fertilization are semi-buoyant, slowly sinking to the bottom of the river. They are carried downstream at the mercy of currents and eddies until they fall into small crevices between stones or gravel or among the aquatic vegetation. Thus the eggs and newly hatched fry are arrested in the areas of high sulfite waste liquor and where slime fungus blankets certain areas of the bottom of the river.

The next section deals with smelt. During the period 1950 through 1954, experimental work was conducted by Smith and Saalfield on smelt response to various dilutions of sulfate base effluent. Many commercial fishermen expressed belief that the nearly complete failure of the Cowlitz River smelt run during the period 1949 to 1952 may be attributed to the discharge of industrial pollutants in the Longview area. The experiments were undertaken to measure the directional response of migrating smelt. The effluents utilized were acquired from the Longview Fibre Company, which discharges primarily a sulfate base effluent, the Weyerhaeuser Timber Company Pulp Division, which discharges a mixed effluent containing both sulfate and sulfite wastes, and the Reynolds Aluminum Company, which discharges a waste with a relatively high concentration of fluoride materials.

The results will be presented in a table accompanying the formal statement, but, generally speaking, in regard to the results of the experiment, it can be said that the results indicated that the response of the smelt showed a significant preference to the unaltered water.

With regard to the experiments to the combined sulfate and sulfite base effluent from the Weyerhaeuser mill, it can be said that the responses of the fish indicated a significant preference for the unaltered channel up to the point where the dilution level became as high as 1:800 parts in the altered channel. At this dilution, no significant preference was noted.

In the third experiment, with the fluoride base effluent, the smelt again exhibited a decided preference to clean water, except at the highest dilution level.

The conclusion reached from the findings is obvious -- there is merit in keeping pollution to a minimum.

Smelt catches, as shown for the shad, are governed a great deal by market demand. When the market becomes saturated, landings will decrease, despite the fact that large quantities of smelt are still available. Recent years have shown a decided increase in the number of fishermen engaged in fishing for smelt, but no corresponding increase in catch. Average annual landings have always xceeded one million pounds.

The known smelt spawning grounds in the Columbia River system are located in Grays River, in the Columbia near Stella, Cowlitz and Kalama Rivers, in the Columbia River near Martin's Bluff, Kalama, and in the Lewis and Sandy Rivers. As the fish progress upstream, they have no choice but to swim through the polluted water to reach these spawning areas.

With your permission, I would like to point out the areas in question. (Indicating on map) The Columbia River near Stella below Longview, the Cowlitz and the Kalama Rivers, Cowlitz, Kalama, Martin's Bluff near Kalama, and then the Lewis and Sandy Rivers.

We have a statement with regard to our research in connection with pollution by the sulfate and sulfite pulp mills.

For many years, pulp mill wastes, especially waste liquor from the sulfite pulping process, have demanded the most immediate attention as a major industrial waste causing pollution in this State.

In 1949, the Washington State Fisheries Department and the Washington Pollution Control Commission, with financial assistance from the United States Public Health Service and the Pacific Marine Fisheries Commission, established a biological research project at the Department's Deception Pass marine research station near Anacortes, Washington. The purpose was to determine the effects of certain waste materials from industrial operations on fish and other aquatic organisms common to this region. The initial studies involved the effect of sulfite waste liquor on the various species of salmon, and the results are reported in Research Bulletin No. 1 of the Washington Department of Fisheries. After extensive laboratory studies, the following sulfite waste liquor concentrations were found to be capable of killing significant numbers of juvenile salmon during continuous exposure for 30 days in the presence of ample amounts of dissolved oxygen.

Here again we are presenting a table of results. I'd like to recite the results obtained on the species of chinook and silver salmon, showing their age, and the threshhold sulfite waste liquor concentration, that is, the concentration at which significant numbers will be killed when exposed for 30 days with ample oxygen in the solution.

Chinook salmon at the age of 38 days, at the threshhold sulfite waste liquor concentration of 1,175 parts per million; at an age of 280 days, 600 parts per million; at an age of 305 days, 560 parts per million; for silver salmon, at an age of 351 days, the threshhold concentration was 1,230 parts per million; at an age of 412 days, the threshhold concentration was 1,015 parts per million.

Additional tests were conducted with pink and chum salmon, but for the Columbia the tests were for chinook and silver, the most prevalent.

Since dissolved oxygen was maintained in all the experimental aquaria in concentrations greater than five parts per million, mortalities of the test animals were due to the lethal qualities of sulfite waste liquor alone. Adverse effects, including loss of equilibrium and sluggishness, occurred in much lower concentrations than those listed above and indicated that in non-lethal concentrations of sulfite waste liquor the salmon would be more susceptible to natural predators. Susceptibility to sulfite waste liquor of each species of salmon increased with age within the range of ages tested. Furthermore, at the age when the various species on their seaward migration are present in an estuary, such as the lower Columbia River, the chinooks were more susceptible than the other species of salmon tested. Other laboratory studies showed that marine organisms used most extensively as food by the salmon have less tolerance for sulfite waste liquor than salmon.

The next statement pertains to kraft pulp mill wastes. Since the waste liquor in kraft pulping is processed for recovery, the toxicity of kraft wastes to young salmon is much less than that from the sulfite process. However, wastes from loosely operated kraft mills may contain substantial amounts of toxic materials, and the effects of the effluent on aquatic life will vary according to the degree of recovery provided. In the bioassays at the Deception Pass marine research station, the concentrations of sulfite waste liquor were recorded in terms of parts per million of 10 per cent solids, while the concentrations of kraft waste effluent were recorded in terms of the dilution ratio of the entire waste flow without reference to solids content.

A report on the effects of kraft waste effluent on young salmon has been prepared for publication. Generally speaking, a dilution of at least 1:100 was found to be necessary to avoid deleterious effects on young salmon. In one experiment, exposure of 63-day old chinooks for 30 days to a dilution of 1:169 resulted in a significant reduced growth rate. Some of the vital fish food organisms were found to be comparatively susceptible and others more tolerant than young salmon to the kraft waste effluent.

As to other pollutants, the toxic effects of a wide variety of organic and inorganic pollutants were also tested at the Deception Pass marine research station. For the most part, the substances tested were known components of industrial wastes discharged into the waters of this State. For example, the waste waters from aluminum plants, such as those on the Columbia River, are known to contain fluorides. One bioassay with 3½ inch silvers exposed for three days to sodium fluoride in fresh water indicated a critical tolerance level of less than 500 parts per million.

I might add, Mr. Chairman, that these various reports that were cited in this statement are also included in this report as literature, and that concludes our statement.

CHAIRMAN STEIN: Mr. Everts, do you have any comments you want to make?

MR. EVERTS: No.

MR. POSTON: I have nothing.

MR. MILLER: I haven't a question, but I'd like to make a statement that the Washington Pollution Control Commission has plans to be consummated at an early date to employ a board of biological consultants to review all of the data on the effects of sulfite waste liquor on salmon and other fish. I think that will resolve some of the differences of opinion that might exist at the present time.

CHAIRMAN STEIN: Will you wait just a moment, Mr. Holland? I want to ask you a question.

On the basis of the work you have done and the literature and studies you have analyzed, would you say that in the mainstem of the Columbia River that discharges from pulp and paper mills have a deleterious effect on chinook salmon, silver salmon, smelt and shad, as far as the fish's growth and well-being is concerned?

MR. HOLLAND: Laboratory assays might indicate to that effect. However, I have not been on any surveys on the Columbia River, in any field observations. I'm not qualified to answer from that standpoint, but perhaps Mr. Wendler may wish to elaborate on that. Our assays would indicate a deleterious effect. Of course, a dead fish is much more difficult to observe in the field. It sinks to the bottom out of sight, or is quickly taken up by a predator. So, it's difficult to make a positive statement on that.

CHAIRMAN STEIN: Thank you, sir.

MR. MILLER: I'd like to call Dr. Bucove, Director of Health of the State of Washington.

DR. BUCOVE: Thank you, Harold. While I'm a member of the Pollution Control Commission of the State, I'm making this report, Mr. Chairman, as Director of the State Department of Health. This presentation will, therefore, be limited to our main role in the area, that of domestic and sanitary waste disposal, and our purpose in making this presentation is to add a little emphasis to the aspects of the problem in the area under consideration. We don't like to see them overshadowed by the technical and industrial aspects of waste pollution in the Columbia River.

For the purposes of brevity, Mr. Chairman, I would like to confine my oral presentation to a brief general statement of the Department's present role and projected role in the area under consideration in a summary of a statement I have here for presentation.

CHAIRMAN STEIN: We can attach your statement as Washington Exhibit 3.

...Thereupon, the document referred to was marked Washington Exhibit No. 3, and such document accompanies the original transcript of the conference...

DR. BUCOVE: I would like that. Our present operating program in regard to existing treatment plants is as follows:

The State Health Department receives monthly operation reports from all the plants in this area. This allows close supervision of their day-to-day operation and provides a record of accomplishment. The number of certified sewage plant operators is indicated in a table in our report. The voluntary program of certification requires a candidate to take a three and a half hour written examination and evaluation of experience. A six man board appointed by the Pacific Northwest Sewage and Industrial Wastes Association, composed of three currently employed sewage work operators, one representative of the Association of Washington Cities, one representative of the engineering faculty from the State College or University, and one representative of the State Health Department, passes on the applicant and may award a certificate in one of five groups. The operators in the lower Columbia area, for the most part, have taken the opportunity to have their ability recognized by becoming certified.

It can be stated that a great deal of progress in Washington has been made in providing treatment of sanitary waste discharges. Disinfection, while not as effective in all cases as is expected, is being carried out in all plants. Operation and caliber of training of operation person is in a very favorable position when compared with other areas of the State.

Our future projected program is as follows:

This Department in a cooperative program with the Washington State Pollution Control Commission and the local health departments intends to lend its efforts to get satisfactory treatment as fast as feasible of all sanitary wastes not now treated. This includes Ridgefield, Battleground, Vader and Cathlamet.

We plan to encourage further separation of storm and sanitary waste and reduction of infiltration such that sewage plants will be less often hydraulically overloaded. This includes Camas, Vancouver, Woodland, Kalama, Kelso, Longview, Morton and Winlock.

Extension of sewers to areas in need will be encouraged.

This is desirable in Camas, Vancouver, Ridgefield, Battleground, Kalama, Woodland, Kelso, Longview and Cathlamet.

We will require and encourage more effective sewage chlorination in Vancouver, Columbia Academy, Kelso, Longview, and Morton.

We plan to continue working with our Oregon counterparts in requiring equal treatment and chlorination on the Oregon side of the river.

We plan to continue to improve sewage plant operation through training of operators, certification program, visitation and recommendations.

We plan to continue working with the State Pollution Control Commission in the preventing of unacceptable industrial wastes that will unduly affect public or industrial water systems or endanger the public health.

A summary of our statement is as follows:

Historical background material in our files indicates that a slime problem existed as early as 1926.

The water quality objectives of the Pollution Control Council of the Pacific Northwest area are suggested as the guide to evaluation of the lower Columbia pollution problem.

The water supplies using raw Columbia River do not meet the suggested standards due to high coliform counts. Bathing, swimming, boating, and fishing, and other uses are impaired by high coliform counts.

Communities along the Columbia avoid, for the most part, use of the Columbia River water, and those that do have been forced to provide extensive treatment. A table of water supply information is given. Possible future uses are described.

Domestic sewage sources on the lower Columbia in Washington are given in table form, together with connected population, dates treatment was started, degree of treatment, chlorine use, operation reports submitted, and operators certified. A written description is given of each community's facilities. Costs, design flow, etc., are given. Operation and certification program data is given.

The treatment of all domestic sewage going to the lower Columbia is fast becoming a recognized fact. Effective chlorination of all treated effluents should be made an immediate goal of both Washington and Oregon. An outline of this department's future correction program is given.

CHAIRMAN STEIN: Thank you, Dr. Bucove.

Mr. Everts, do you have any comments or questions?

MR. EVERTS: I have one question, Mr. Chairman. I would like to have a little further explanation of what the Doctor intended to imply by Item No. 5 on the future correction program, in which they were to encourage the Sanitary Authority to require equal treatment and chlorination on the Oregon side of the river.

DR. BUCOVE: You may note that I changed that in our oral presentation to read:

"We plan to continue working with our Oregon counterparts in requiring..."

Does that satisfy you?

MR. EVERTS: I was concerned about equal treatment and chlorination. What do you mean by "equal treatment"?

DR. BUCOVE: I think probably, referring to Mr. Kittrell's presentation this morning, the fact was borne out that there seemed to be an unbalance in the amount of success we have been having on our side of the river with regard to treatment.

MR. EVERTS: For the information of this conference, I would like to mention that Mr. Kittrell's report did not mention the fact that a treatment plant is now under construction at St. Helens, and bids are being received today at Rainier for the construction of a treatment plant. I think that evens us up.

DR. BUCOVE: I'm very happy to have that information, sir.

CHAIRMAN STEIN: Do you have any further comments or question, Mr. Everts?

MR. EVERTS: No.

CHAIRMAN STEIN: Mr. Poston?

MR. POSTON: Nothing.

CHAIRMAN STEIN: Mr. Miller?

MR. MILLER: No.

CHAIRMAN STEIN: May I ask you a question? As I understood it, you said that the Columbia River was, at least, a potential source of water supply for various communities.

DR. BUCOVE: I inferred such, yes.

CHAIRMAN STEIN: And that the coliform count was such that it was above standards that you considered reasonable for a raw water supply?

DR. BUCOVE: That's correct.

CHAIRMAN STEIN: And that the cities were avoiding the use of it. Now, could we infer from that statement that, if the treatment facilities were installed so as to bring the coliform counts down, that the Columbia River could be an acceptable source of a potential water supply by providing such facilities?

DR. BUCOVE: I feel that, if we could meet such a condition, certainly the Columbia River would be considered as a source of water supply.

CHAIRMAN STEIN: Thank you.

MR. MILLER: Is there a representative of the Washington Department of Game here with a statement?

MR. PRICHARD: Well, I'm here, but in my last report I was told that there would be a paper presented to this body, and on my leaving I had not received a copy of it. I don't know whether you have, but I have a paper to present.

CHAIRMAN STEIN: May we have your name for the record?

MR. PRICHARD: Albert T. Prichard, member of the Washington Game Commission.

MR. MILLER: We'll call for the Game Commission again after you finish your statement, Mr. Prichard. Mr. Nelson made a statement on this matter this morning. We have him on the list. I don't know if you intended to make a statement on behalf of another organization.

MR. PRICHARD: I have two letters, sir, that were given to me for presentation at this meeting, one from the President of the Vancouver Chapter of the Washington Wildlife League, and the other from the Salmon Committeeman of the Rainbow Anglers. I could just present the letters, if you wish, or I could read them -- whatever you desire.

MR. MILLER: Well, as to reading them, I'd leave that up to your desire, but, if you don't care to read them, you may present them to the Reporter.

MR. PRICHARD: Very well, sir, I'll read them.

This letter is from Roy Walker, President, Vancouver Chapter, Washington Wildlife League.

"Dear Mr. Stein:

"The Vancouver Chapter, Washington Wildlife League, feel very strongly that the present polluted condition of the Columbia River is not in keeping with the conditions necessary for maximum recreational utilization. It is a well known fact that recreation, such as salmon and steelhead fishing, water skiing, and boating, is of great economic importance to the Northwest. Many thousands of boats, both commercial and sport, use the Columbia River.

"The shores of the river in many areas are used for picnicking and camping. A large number of camp grounds, picnic areas, and recreational beaches could be established on the Washington side if the water were of a purity that would warrant their construction.

"Population trends are to the Northwest and the population is increasing daily. These people look to the Columbia for recreational activity.

"Statistics prove that recreation in all of its aspects is the third largest industry in the State of Washington. It appears to us that such a large industry compels pollution abatement in all water areas and, in this point, the Columbia River.

"We certainly concur with other interested parties that the U. S. Public Health Service should intervene on the Columbia River and do all in its power to abate the pollution."

That is signed by Roy Walker.

The next letter is from J. W. Arrasmith, Salmon Committeeman, Rainbow Anglers Club, Vancouver, to Mr. Murray Stein.

"Dear Sir:

"In regard to the pollution of the Columbia River by industrial wastes, I would like to state the problem that confronts the sportsmen.

"As you may know, dredging operations in the Columbia River cause the formation of large sand bars or beaches along the shores. On these bars the steelhead and salmon congregate and travel. This furnishes fishing, picnicking, and related recreations to thousands of people in the lower Columbia River area.

"The waste pulp fiber and slime discharged from the paper mills on the Columbia River at times makes fishing practically impossible. Although the lines used are of a monofilament type, they become so loaded with waste material that in a few minutes' fishing it is impossible to reel them in until the line is cleared. The lures generally used are of "spin-glow" or cherry bobber type. These will become so corroded and covered with refuse that they become inoperative.

"An example in point is the small bar at the downstream outskirts of Vancouver, Washington, between the city limits of Vancouver and the Alcoa Aluminum Plant approximately one mile downstream from the Columbia River Paper Mill. Formerly this bar produced excellent fishing all summer. This year it is impossible to fish at all because of slime and waste material from the paper mill.

"While realizing that industry and resulting employment is vital to the welfare of the community, it is our opinion that irresponsible discharge of waste matter into our public waters merely to increase the profits of an organization certainly does not contribute to the welfare of a community."

That is signed J. W. Arrasmith.

CHAIRMAN STEIN: Mr. Everts, do you have any questions or comments?

MR. EVERTS: No, sir.

CHAIRMAN STEIN: Mr. Poston?

MR. POSTON: I have nothing.

CHAIRMAN STEIN: Mr. Miller?

MR. MILLER: Do you want these letters?

CHAIRMAN STEIN: We'd like to have those in the file, and I suggest to the secretary that we make a note of the dates on those letters, which was not read into the record.

MR. PRICHARD: The letter from Mr. Arrasmith is dated August 26th, and September 10th on the one from Mr. Walker.

MR. MILLER: Is there a representative here from Crown Zellerbach Corporation?

MR. BOYLON: Mr. Chairman, ladies and gentlemen, my name is F. O. Boylon. I live in Camas, Washington. I am resident manager of the Crown Zellerbach Corporation pulp and paper mill.

All of us here share an interest in the Columbia. This multiple purpose stream is one of the great resources of the Northwest. Crown Zellerbach relies heavily on the Columbia and has ever since one of its predecessor companies at Camas brought the pulp and paper industry to what is now the State of Washington. They brought it 75 years ago. Today this mill has 2600 employees, whose pay checks total 15 million dollars a year. Were it not for the river and its water, there would be no paper mill at Camas.

Ours is an industry based on wood and water. At Camas, we use Columbia River water to supplement our supply from deep wells and lakes. Columbia River dams generate most of the power that operates the mill. The river and its tributaries form a water highway over which we tow in logs harvested in a dozen downstream Washington and Oregon counties. These logs are the raw material out of which we make pulp for paper. River barges loaded at Camas bring paper products to Portland and other river ports for shipment to markets all over the world.

The Columbia also serves as a convenient and fireproof storage basin for the log rafts we must keep in reserve to guarantee an around-the-clock seven-day operation at the Camas mill. In its capacity as a multiple use stream, the Columbia fulfills yet another essential service. It carries away the highly diluted effluents of our several pulp-making processes, all of which are carefully monitored and controlled by a comprehensive millwide effluent sampling system.

I should point out here that all domestic sewage from the Camas plant is segregated and is treated in a modern, efficient sewage treatment plant owned and operated by the City of

Camas. Our mill effluents are completely free of pathogenic bacteria of the type injurious to public health.

Our effluent discharges are a matter of record. Reports are filed regularly with the Washington Pollution Control Commission. From its very inception, this Commission has had full cooperation from Crown Zellerbach mills at Camas and elsewhere. For instance, eight years ago, the company at the request of the Washington Pollution Control Commission installed a deep water diffuser line through which pulp mill effluents are discharged in the main channel of the Columbia River at a depth of about 45 feet. Cost of this installation and maintenance since that time have totaled well over a half million dollars. Over the past ten years, the Camas mill has spent more than two million dollars for internal plant installations designed to improve water quality. As a result of these improvements and better operating procedures, our stock losses per ton of product have been reduced 140 per cent since 1935.

Typical of our cooperation is the joint study agreed upon by Crown Zellerbach and the State of Washington two years ago to investigate the precise causes of a sphaerotilus growth in the Columbia River and, if possible, determine a method or methods for its control.

...Reporter's Note: At this point, Mr. Boylon deleted portions of his prepared statement. At a point subsequent in the conference, a request was made of Chairman Stein that the entire prepared statement appear in the transcript, and the Reporter was thereupon instructed to insert the prepared statement in its entirety...

Sphaerotilus is found in many parts of the world. It occurs in clean rivers such as the Columbia when temperature, velocity and phosphorous content reach a balance favorable to growth. These conditions appear to vary from year to year. Sphaerotilus does not constitute a public health problem and is not toxic to fish.

From all sanitary engineering criteria, our study has shown that the 14 mile stretch of the Columbia River from Washougal to the Interstate Bridge at Vancouver is not polluted. At no time during the past two years has the dissolved oxygen of the river in this area dropped lower than eight parts per million. The decrease in dissolved oxygen directly attributable to the Camas mill discharge is less than one-half part per million. The biochemical oxygen demand (B.O.D.) below the mill outfall varies from one to three parts per million. The background B.O.D. is about one part per million.

(Interpolating) Again, I would like to point out that there is no scientific basis for a comparison of sewage and pulp or paper mill effluents by population equivalent. Domestic sewage has pathogenic bacteria where pulp and paper mill effluents are free from these organisms.

(Returning to text) Spent sulfite liquor discharges by Crown Zellerbach Corporation at Camas, Washington, contains approximately two per cent sugar content. The conversion of these sugars to sphaerotilus may be rather inefficient since competition for the available sugars occurs among the complex and varied microbial population in the river, and a major portion of the organic load may be consumed by bacteria other than sphaerotilus.

It is well to point out that the mere addition of certain organic materials found in pulp and paper mill effluents, such as sugars, to the river is not sufficient to promote sphaerotilus growth. Nutritional requirements of sphaerotilus are complex. It has been shown by exhaustive studies that nitrogen and phosphorus are essential for its growth and without these two elements, it cannot exist. Pulp and paper mill effluents are deficient in these essential elements. These elements find their way into the river through two major sources -- domestic sewage (treated or raw) and agricultural runoff. Both of these sources of nutrients for sphaerotilus growth have been steadily increasing in the upper Columbia, and all information we have confirms a tendency for them to continue to increase in the future.

(Interpolating) Now, the other two speakers from the Washington State Pollution Control Commission covered the formation of the cooperative study group that we had formed. So, I will skip that part of my report.

...As instructed by the Chairman, the deleted portions are included in their proper context...

In a conscientious effort to help develop knowledge which might aid in the solution of the problem of sphaerotilus growth, Crown Zellerbach suggested to the Washington Pollution Control Commission two years ago that it select an outstanding biologist to direct a research study on sphaerotilus growth in the Columbia. The company agreed to provide the necessary funds to conduct the study and to supply laboratory facilities. The study itself was to be under the sole and complete direction of the Commission. In making that commitment, my company pointed out that it had a responsibility to its many thousands of share owners to be sure that any substantial expenditures made in connection with the sphaerotilus problem would, in fact, achieve the desired results.

The Washington Pollution Control Commission agreed to this proposal and the research study began early in 1956. Since that time, our research and operating personnel have met with representatives of the State at regular intervals to review and discuss the project. Last May, it was our privilege, in cooperation with the project's senior scientific advisor, Dr. E. J. Ordal, Professor of Microbiology, University of Washington, to present a detailed progress report to members and staffs of the Washington Pollution Control Commission and the Oregon Sanitary Authority. This was a public presentation attended by interested citizens of both States.

At that time, recommendations were made for further study and for pilot investigations on a broader scale of several promising leads which had been developed. This study is continuing, and we are prepared to proceed with investigations of these major leads: (1) altering the present effluent discharge pattern to avoid the log rafts along Lady Island and the Washington shore which may be major growth areas for sphaerotilus; (2) pilot plant studies of intermittent discharge of effluent to manipulate the feeding schedule of sphaerotilus, so as to control its growth; and (3) intensified laboratory studies of bacterial fermentation of wood sugars in the calcium base sulfite liquor in an economical manner, which might produce commercially marketable animal feeds from the waste liquor.

In all this research, which to date has cost us $150,000, we have given due consideration to the practicability and to the physical and economic feasibility of finding a solution to the problem.

In addition, during the last decade Crown Zellerbach's chemical products division, located at Camas, has spent many thousands of dollars on sulfite liquor research alone. In our sphaerotilus studies with the State of Washington, we have been able to draw freely on the work of these chemical products research teams.

The two year river and laboratory study conducted by the Washington Pollution Control Commission and Crown Zellerbach has already contributed substantially to the store of scientific knowledge about the Columbia. It is only through planned research of this type, carried forward on a comprehensive scale, that we can expect a real solution to the problem of sphaerotilus growth in the river. We believe that reasonable progress is being made on the sphaerotilus situation -- certainly in relation to the efforts of many other groups throughout the country also working on this complex and difficult problem. Continuation of this progress -- on the basic of voluntary cooperation between private industry and the State authorities -- seems to us the best guarantee of achieving early and constructive results.

That's all I have.

CHAIRMAN STEIN: Thank you, Mr. Boylon. Mr. Everts, do you have any questions?

MR. EVERTS: No.

MR. POSTON: I have none.

MR. MILLER: I have no question. I'd like to say that we tried to have Dr. Ordal at this meeting, but he happens to be on the east coast and has been there for several weeks and won't be back for several more weeks. I don't know whether he would want to add to any of these comments, but we did make an attempt to have him here. I did talk to Dr. Ordal about a month ago in preparation for this conference, and he strongly advised continued research on this particular problem.

CHAIRMAN STEIN: Thank you, Mr. Boylon.

MR. MILLER: Is there a representative here from Longview Fibre Company.

MR. WOLLENBERG: Mr. Chairman, ladies and gentlemen, my name is R. P. Wollenberg. I am Vice President in charge of operations for the Longview Fibre Company, which operates an integrated pulp and paper mill at Longview, Washington, which produces some 1,100 tons per day of paper and paperboard from pulp manufactured at the mill primarily by the kraft process. A small portion of the pulp is made by grinding. Our mill employs an average of 1,650 people at Longview. We utilize the Columbia River for rafting of logs, for shipment of products to the east coast and overseas, as a source of process water, and for the discharge of our mill effluent.

We cite the situation of the Longview mill of our company as one case that demonstrates the adequacy of the measures taken by the Washington State Pollution Control Commission and shows progress in the abatement of pollution.

Pursuant to directives from the Washington State Pollution Control Commission and with its technical assistance, our company has done the following:

1. Installed a multiple outlet diffuser to discharge the effluent well out into the river and spread out so that large dilution is immediately achieved. This diffuser has been in effective operation for a number of years except for a brief period this summer when a break occurred in the pipe leading to it.

2. Provided a sanitary sewage disposal plant.

3. Installed additional fibre recovery equipment in the mill.

These changes having been made, the Washington State Pollution Control Commission has granted our company a permanent permit. We are required by this permit to sample our effluent and report the results to the Commission. Thus, we must continue to perform adequately in the recovery of fibre and chemicals so that the necessary water quality of the Columbia River is protected against any undue damage from our effluent.

We would like to make one further point. We note that the U. S. Public Health Service has built up estimates of waste liquor concentrations on the unsupported assumption that waste liquor recovery in a kraft mill is 85 per cent, and that 15 per cent goes to the sewer. Our spent liquor has 3,500 pounds of solids per ton of pulp. Our make-up chemical is 50 pounds per ton of pulp, or about one and a half per cent. Of the loss which is being made up at least one-half goes into our product and about one-fifth goes into the atmosphere so that less than one per cent goes into the river. While the U. S. Public Health Service report clearly states that 85 per cent recovery in the kraft process is only an assumption, much of the reasoning and conclusions following are based on this assumption. How much the report is based on these erroneous assumptions is clearly indicated by the statement on page 24 of the report, and I quote in part:

"...some unknown combination of river characteristics permits Longview wastes to produce intermittent light slime growth..." -- there's a skip in the quotation, and then it continues -- "...rather than concentrated growth..."

If the actual facts as to recovery were used in the report, concentrated growth would not be predicted. We request that the report be revised to reflect the facts as to chemical recovery before being used as a basis for enforcement action.

Now, since I prepared this statement, I've heard the statements today, and I suggest the comparison of Mr. Kittrell's assumed figures with Mr. Gibbs' reported figures will bear out this criticism.

CHAIRMAN STEIN: Thank you. Mr. Everts, do you have any questions or comments?

MR. EVERTS: No.

CHAIRMAN STEIN: Mr. Poston?

MR. POSTON: Nothing.

CHAIRMAN STEIN: Mr. Miller?

MR. MILLER: No.

CHAIRMAN STEIN: For your information, this report was based on available information, as I understand it, available to our investigator when he came out to survey the situation. I would prefer not in this case to talk about enforcement action because what is in here and what we're trying to do is to develop a cooperative effort, to develop the situation to see where we are to go from.

However, I should then say that generally, when we do have an enforcement action -- and this is not necessarily related to the Columbia River -- that will be based on evidence at hearings or in court, and that will be through painstaking evidence put in and not based on any assumptions. You can be sure of that.

Thank you.

MR. MILLER: Is there a representative of Weyerhaeuser Timber Company here?

MR. BAKER: Mr. Chairman, conferees, ladies and gentlemen, my name is Raymond Baker. I am manager of the manufacturing pulp division of Weyerhaeuser Timber Company. For a number of years prior to 1955, I was mill manager of our Longview operation.

We appreciate the invitation from the State of Washington Pollution Control Commission to participate in this meeting.

We are here today as one of the many users of the Columbia River. Our uses of these waters are multiple. They include domestic supply, process water, receiving water for effluents, transportation and storage of logs, and transportation of other raw materials and finished products.

At Longview, Washington, we operate a plywood plant, sawmills, and pulp and paperboard mills. These and related operations at that location provide direct employment for 3,900 people.

In 1948, after years of research and pilot plant work, we installed the world's first magnesium base sulphite pulping process. In this process, we burn the organic material separated from the wood fiber and recover spent cooking chemicals. Our capital expenditures for this recovery system have exceeded $5,000,000. In addition, we have incurred substantial operating expenses in bringing the process to its present high level of efficiency.

As we have expanded capacity to include kraft pulp, semi-chemical pulp and paperboard, we have incurred substantial costs for the installation of equipment in addition to that normally required, in order to further limit the discharge of fiber, barks, knots, chemicals, and so forth, into the river.

In 1952, in cooperation with, and at the request of our Pollution Control Commission, we added a submerged line for effective, quick and adequate dilution of the effluent in the river. This cost $110,000.

A sanitary sewerage system that treats sanitary wastes for the entire plant site was completed in 1957 at a total cost of $196,000.

In our kraft and semi-chemical operations, we have installed chemical recovery systems of ample capacity to insure maximum efficiency.

On the basis of these facilities, together with various other requirements, the Washington Pollution Control Commission issued to us permanent permit No. 679. We submit monthly reports to the Commission giving pertinent data on production and effluent, as requested by the Commission.

River data, which we have collected over the years, have always indicated ample dissolved oxygen to support aquatic life. The lowest value ever recorded within several miles downstream from our outfall was 7.2 parts per million; normally, the low values have been 8.5 parts per million. At no time have we seen any evidence of harmful effects on fish life. In fact, the area for some distance below our dispersal line remains a favorite public fishing area for jack salmon, as well as other species.

The millions of dollars our industry has spent on pollution control equipment and research relating to it have been well spent. In our own case, we have developed a system that is recognized as representing the furthest advance in practicable and feasible pollution control. The B.O.D. loading produced by our mills, which is at a practicable minimum, is discharged into receiving waters that are always near or above the oxygen saturation point. For these reasons, we sincerely believe that our use of the Columbia River represents a minimum of interference with competing uses.

Our belief is confirmed by a marked increase of all types of recreational use of the river. Of commercial uses, only fishing might be adversely affected. Our most recent information, based upon a "Letter to the Editor", written by Mr. Ted Farnsworth, leading commercial fisherman, points to increased commercial catches. There is an attachment to the report reproducing that publication.

...While not so designated by the Chairman, the report referred to has been marked Washington Exhibit No. 4, and such document accompanies the original transcript of the conference...

The only adverse effect charged to the pulp industry is its alleged contribution to increased slime formation. Our Pollution Commission has negatived any possibility of such formations causing injury to fish. In its Progress Report No. 39, it stated, and I quote:

"...slime fungus does not destroy fish or fish food organisms..."

We have been informed that some gillnetters have, during limited periods and in a few locations, incurred increased operating expenses as a result of such formations. Like other users of the waters of the Columbia, the gillnetters should expect to experience some inconvenience and expense in accommodating their use to competing uses. It is for this reason that we have willingly incurred millions of dollars of capital and operating costs in order to insure the compatibility of our uses with other uses.

Now, after listening to this morning's proceedings, I would like to add one comment to our formal statement. The

Federal Act establishes as a development criteria for abatement, and the practicability and the physical and economic feasibility of securing abatement. Mr. Poston, in introducing Mr. Kittrell, referred to him as an expert on evaluation of the Public Health Service rules. I was struck by the complete failure of Mr. Kittrell to include in his evaluation any reference to the extent to which contributors to pollution are presently following practices that are practicable and feasible. That we are doing so is evidenced by our permanent permit from the Washington Pollution Control Commission.

We trust that the report on this conference will remedy the deficiency in Mr. Kittrell's evaluation.

Thank you.

CHAIRMAN STEIN: Do you have any comments, Mr. Everts?

MR. EVERTS: No.

MR. POSTON: Nothing.

MR. MILLER: I have nothing.

CHAIRMAN STEIN: I'd like to make one comment with reference to your statement. I think this is substantially so in all pollution control activities that I know of throughout the country, generally the folks who prepare the scientific reports analyze the situation as to interference with water use, as well as an analysis of the stream and the type of wastes coming into the stream. When we speak of experts in this field, we do not speak of them in terms of evaluating economic or physical feasibility of securing a method of treatment.

Generally, those matters are left to a board in the State or an official agency in an official capacity, and I think Mr. Kittrell's capacity here related to about the same as you may have in any official State agency. I don't think it is very unusual.

Thank you.

MR. MILLER: Are there any other representatives of pulp and paper industries that would like to make a statement?

MR. BARNES: Mr. Miller, my name is Francis Barnes. When Mr. Boylon made his statement in accordance with the invitation from the State of Washington, he omitted certain portions of his prepared statement. I would like at this time, if it's agreeable with the conferees, to make sure that the entire statement is inserted in the record.

CHAIRMAN STEIN: Without objection, we will so do, and that will appear in the stenographic report of the record as if those portions had been read.

...See "Reporter's Note" on Page 98...

MR. MILLER: Mr. Prichard, has the official statement arrived of the Game Commission?

I might say that Mr. Prichard has asked me to point out that, while he is a member of the Washington Game Commission, he is making this statement in his own behalf.

MR. PRICHARD: Mr. Chairman, fellow conferees, ladies and gentlemen:

I am making this statement today in behalf of the Cowlitz Game and Anglers Club for the Chairman of the Pollution Committee. I have been a member of this committee for a number of years, and I've actively participated in the pollution problem on the Columbia, and I would like to digress just one moment if I may and apologize, if that is necessary, for the fact that the paper has not arrived from the Game Department, as I was assured it would. As I think most of you know, we recently moved to new offices in Olympia, and maybe it's lost somewhere. I just don't know. We have new personnel there, and so confusion could arise.

CHAIRMAN STEIN: Mr. Prichard, you seem to have the same trouble in your State that we have in the Federal Government. We couldn't get our copies of Mr. Kittrell's report here either. They seem to be some place between Cincinnati and Portland.

MR. PRICHARD: I'm glad then that the State of Washington isn't the only one that has troubles.

In this paper here, I would like to state that the purpose of this presentation is to give the United States Public Health Service conference information concerning our experience with pollution in the lower Columbia River, its effect on water uses in the past, and the effect on the economy of the nation that we believe will occur if pollution abatement practices are not put into immediate effect.

The following statements are not entirely original as most of them are compiled from reports made by various State and Federal agencies, but, because of this, they are factual and we ask the Federal and State authorities concerned to give careful consideration to the statements contained herein.

VALUE OF THE LOWER COLUMBIA RIVER FISHERY AND RECREATION PROGRAM

That the Federal Health Service recognizes the value of the fishery and recreational activities in this area is evident in their report "The Pacific Northwest Drainage Basins", made public in 1951. In this report, the Federal Health Service stated:

"The commercial fishery industry of the Pacific Northwest is of great importance to the economy of the area. This industry's capital investment in fishing equipment, boats, and packing plants is estimated to be in the neighborhood of 200 million dollars. Data are not available for the Pacific Northwest as a whole, but according to the Washington State Department of Fisheries, the wholesale value of fish, fish products and by-products, plus the money paid Washington fishermen for their catch during the year 1949, is estimated to be 100 million dollars."

In evaluating the recreation program to the area, the report goes on:

"In former studies of the economic wealth of the Pacific Northwest, recreation has not always been considered as a major industry. The actual number of people this industry supports and the number who partake of the recreational opportunitie in the area are not known. It has been estimated by state agencies and others concerned, however, that tourists spent over 300 million dollars in the Pacific Northwest during 1949. Not included in this total is the money spent for recreational purposes by local residents."

This has been a few years ago. That has undoubtedly increased many-fold. The report goes on:

"Recreational opportunity in the lower Columbia drainage area is diversified and great. This area, rich in natural beauty, attracts many visitors. Fishing, hunting, picnicking, boating, camping, swimming, mountain climbing and winter sports are readily available to all people living in the sub-basin and surrounding areas. People from all over the world are attracted to the area by the famous Astoria and other Columbia River salmon fishing derbies, the winter sports at Timberline Lodge and

Government Camp, recreation areas at Columbia Gorge and the many other activities along the Columbia River. Obviously the recreational income is as important as the income from other major industrial activities."

To point out the importance of the part played in the value of the Pacific Northwest fishery by the Columbia River, we will quote from a publication by the Washington State Department of Fisheries of 1958:

"...a compilation prepared by the Washington Department of Fisheries statistical section (from information based on tag recovery data) points up the contribution of the Columbia River (salmon) stocks to the Pacific troll fisheries. This report states that Ralph P. Silliman in a paper published in 1948 estimated the Alaska troll catch of Columbia River origin chinook as follows: Ketchikan 30%, Sitka 20%, Pelican City 16%. Parker and Kirkness in 1956 estimated on the basis of tag recoveries the Columbia River contributed to the troll chinook catch as follows: Ketchikan 46%, Pelican City-Sitka 41%, north of Pelican City 70%.

"Silliman also gives figures ranging from 36% of the Queen Charlotte Island troll catches to 75% of those in the Columbia River vicinity. H. Heyamoto of the Washington Fisheries Department in 1954 estimated on the basis of two marking experiments that the Columbia River fall chinook run constituted 45% of the total troll catch of Oregon, Washington, and the west coast of Vancouver Island. (His figures do not include data based on the contribution of the spring and summer runs to the fishery of this area.)

"California troll chinook are largely of Sacramento origin, according to a report by Fry and Hughes in 1951. However, there are apparently some northern stocks contributing to this fishery, since two percent of recovered California tags come from the Columbia River vicinity or northward. From studies outlined above, at least half of these can be considered Columbia River stocks or approximately 1% of California landings."

This report, which is available from the Washington State Department of Fisheries, goes on to show importance of comparable value played by silver, sockeye, pink, and chum salmon of Columbia River origin.

The same report states:

"A growing menace to fisheries appears with pollution of waterways, lakes and streams. Toxic trace minerals and waste resulting from domestic and industrial development often can be destructive to practically all forms of marine life. Abatement of pollution is a requirement in fisheries management."

The Congress of the United States, recognizing the value of the Columbia River fishery, appropriated money for the Federal Fish and Wildlife to engage in a multi-million dollar salmon and steelhead rehabilitation program in the Santuary area on the lower Columbia River in an effort to compensate for fish loss caused by upriver federal dams. Approximately 20 million dollars has already been spent on this continuing program and it is said the cost will eventually be over 30 million dollars.

From these facts, there can be no doubt as to the value of the Columbia River fishery or of the recreational program made possible by clean water in the lower river.

Some of the most prevalent sources of pollution are the pulp mills located at Camas, Vancouver and Longview, Washington, and wastes that are barged from an Oregon mill down the Willamette River and dumped into the Columbia. These concentrations of waste sulfite liquors exert an oxygen demand which reduces the dissolved oxygen concentration of the river water and causes growth identified as sphaerotilus.

Excessive loss of oxygen in the river water may result in a fish kill as happened in a comparable instance in Everett Harbor in 1949 when thousands of fingerling size fish were found dead on the beach and Pollution Control Commission field engineers observed adult salmon circling on top of the water and finally sinking to the bottom exhausted. This condition was the result of the discharge of pulp wastes in the Snohomish River being held up by an incoming tidal action until the concentration reached the point where a complete lack of oxygen was observed in the entire area within a quarter of a mile of the river mouth. This can be referred to under the title of "An Investigation of Pollution in Port Gardner Bay and the Lower Snohomish River", a copy of which may be found in the files of the Washington Pollution Control Commission at their office in Olympia.

Wood fiber, which is discharged from these mills and others, despite the use of modern savealls and settling tanks -- this amounts to between 25 and 60 pounds per ton of dry pulp according to the Oregon Sanitary Authority and the Washington Pollution Control Commission -- does not disintegrate and covers submerged objects and blankets the bed of the river. This covering of fiber not only smothers out food organisms but covers spawning beds and aids in the production of sludge. Fiber from pulp mills has been found 15 to 20 miles downstream from the source.

In addition to lowering the dissolved oxygen content of the river, waste liquor may act as a toxin and affect fish life. This toxic action may result in complete extermination of fish, or in less serious amounts may slowly but steadily diminish the fishery over a period of many years. In 1941, when the spring runs of fish in the Columbia River were decreasing in abundance, and the fall runs were increasing, it was assumed by the Oregon Sanitary Authority and the Washington Pollution Control Commission that, because pollution was at its greatest during the fall runs, which occurred during low water stages, pollution was not the determining factor in the decline of these fish. However, at the present time, the spring runs are gaining, and the fall runs are decreasing in numbers at alarming rates. It would seem reasonable, by the same line of reasoning, to assume that pollution is now playing an important part in the decline of these fish.

Tests made by the pollution control authorities have proven that sphaerotilus is always present below the outfalls of pulp mills using the sulphite process of making pulp. Sphaerotilus in large amounts makes commercial fishing almost impossible and causes a serious economic loss to the fishermen and through them to the entire area. This slime growth also causes rapid deterioration of commercial fishing nets and sports fishermen's lines when they are used in water infested with this growth.

After a two year study of pollution in the Columbia River, the Washington State Pollution Control Commission and the Oregon Sanitary Authority published a report, in which they stated:

"It is recommended that the pulp and paper mills at Camas, Vancouver, and Longview, Washington using the sulfite pulping process take steps to accomplish more effective and immediate dilution of their waste sulfite liquor. At no place in the river should the concentration of waste sulfite liquor (containing 10 percent total solids) exceed fifty parts per million. Since sphaerotilus does not grow well in places where the concentration of waste sulfite liquor is below 50 p.p.m.. it is expected that adequate dilution would largely eliminate the present slime nuisance."

These mills took the recommended steps by placing the outfall ends of discharge pipes further out in the river and by adding diffuser nozzles to these pipes. The result was that a greater portion of the river, including the main channel, was infected and the growth of sphaerotilus has increased to the point where the Director of the Washington Pollution Control Commission in 1957 requested a special meeting with a pulp mill and sports and commercial fishermen to review the waste disposal projects at this mill. The letters from the Director gave as a reason for holding this meeting, "During the summer and fall season the slime fungus problem on the Lower Columbia River has been serious."

Indeed it was and is. Commercial gill nets, floating types, in the river were gathering such heavy accumulations of slimethat the nets were actually sinking as a result.

When the meeting was held, the company explained the experiments they had been attempting with calcium based cooking liquors and stated that, "If their present experiment worked out successfully a pilot plant is contemplated. If this is successful, full elimination of the waste sugars from the mill will be possible but a minimum of four years time will be required to achieve that result."

In the meantime, because of increased production in the mills, the pollution load gets heavier and heavier.

Conclusion: The pulp mills have certainly not kept pace with cities and towns on the lower Columbia River in eliminating pollution.

The people in each community on the river have supported the local authorities' efforts to raise bond monies to construct sewage treatment plants with no thought of profit except that derived from having clean water. Every seweraged community on the lower Columbia River either has a sewage treatment plant or is in the process of getting one.

On the other hand, complete and profitable use of spent liquor components, sugars, lignin sulphonates, and other by-products of the pulp and paper industry is what is being sought by the industry. This is from a paper by Technical Associations of the Pulp and Paper Industry -- The Pulp Mills Research Program of the University of Washington.

What has happened to those mills which have attempted to make partial use of their spent liquors? Let us review two of them.

From the Federal Health Service report on the Pacific Northwest Drainage Basin, we quote the following:

"Sulphite pulp mill wastes which have affected the shellfish industry have been partially eliminated by the construction of an alcohol recovery plant by the Puget Sound Pulp and Timber Company at Bellingham. Since installation of the alcohol recovery plant it has been possible to re-establish the oyster producing industry in this area."

In the last Puget Sound Pulp and Timber Company's report to their stockholders, the first paragraph reads as follows:

"Strength in earnings of the by-products division of our business continue to act as a partial offset to a decline in profits from pulp manufacture. With this support we are able to present a considerably better profit performance for the first six months than would have been the case had our operations been limited to pulp manufacture."

Again quoting the Federal Health Service report:

"The Weyerhaeuser Timber Company's mill on the lower Columbia River at Longview, Wash. has developed and installed a magnesium base sulphite pulping process which burns all sulphite liquors and recovers both chemicals and heat. In its operation, returns in the form of chemical and heat are expected to be sufficient to pay operation costs and may defray the initial cost of installation."

It will be interesting to secure factual evidence from this company in regard to actual operating costs of this process which is said to reduce the total organic pollutional discharge by 50 per cent.

From these statements, it would appear that both of these mills have profited from their efforts to reduce pollution. This gain should be taken into consideration when figuring costs from future efforts at complete elimination of their pollution.

We also feel that the Federal Government would be justified in allowing certain tax reliefs to the pulp and paper industry for plant installations found necessary for complete elimination of waste materials from these mills. We believe this to be justified, not only because of the economic value to the recreational programs and the commercial fishery of the area, but because Congress should protect the multi-million dollar salmon and steelhead rehabilitation program which it is now promoting.

We believe that complete elimination of this pollution at its source is necessary because past experience has proven that partial elimination and diffusion is not the answer. Controlled experiments at Crown Zellerbach's laboratories have proven that as little as one part of one part per million of W S L will cause sphaerotilus to grow under certain conditions.

We believe that all users of the public waters should replace that water in just as pure a state as it was when taken from the public.

The growth of our human population is tremendous. Census experts tell us that this country's population will increase to 250 million by the year 2000. Along with such increase in population will come more intensive use of land and water with rapid and constant changing conditions. Along with population growth and movement is a corresponding growth in outdoor recreation, including hunting and fishing. Not only are people making higher salaries than ever before, but we have a shorter and shorter work week with more and more leisure time.

There is little area left in the United States for increased population to spread except to the west. Those who don't actually move here to live are swelling the ranks of tourists coming here as a result of more money, more time, better roads and better automobiles. So, while needed wildlife habitat is shrinking, the demand for more game and fish is increasing rapidly.

Conservationists are faced with the problem of trying to maintain enough game and fish to supply an increasing demand in the face of shrinking habitat; of trying to keep up to modern conditions with inadequate or laxly enforced laws.

If wildlife management is to exist, we must recognize the whole broad picture of production and natural resources in relation to human needs, and then we must plan our programs accordingly. It is necessary too that all interests, including those of soil, water, forestry, agriculture, industry and wildlife, recognize the unity and complete interrelationship that exists between all portions of the conservation movement.

The number one job confronting us today is the problem of water management -- and it is a big one. Many people seem to have the idea that the country's water supplies are inexhaustible. Nothing could be further from the truth.

The earth's cover of soil and vegetation is being stripped thin in too many places. Under normal conditions, this cover helps the soil store great quantities of water in the underground water table. Except for normal runoff in time of rain or melting snow, all water receives its supply directly or indirectly from this source. This water table is receding at an alarming rate, which results in reduced river flows. The remaining water becomes warmer. At the same time, industrial and municipal demands for water are increasing. They add to the pollution load and at the same time reduce the amount of water available to dilute their own pollution.

The time is here when any chance margin of safety has been eliminated. No longer may we be content to try to correct a pollution problem after the damage is evident. We must concern ourselves with the prevention of such damage while that is yet possible.

That fish are dependent upon soil quality has been proven time and again by wildlife and soil technicians. This may surprise some, but fish is as much of a crop of the land as wheat or timber. The ability of any body of water to support abundant fish life depends upon the available plant and animal food. These organisms in turn depend upon the nutrients in the water and their abundance and quality is directly related to the fertility of the soil on which that water lays or over which it flows. Better fishing is not going to be created by releasing hatchery-reared fish in waters incapable of supporting them.

In too many instances, our management program has not given adequate weight to the so-called secondary use purposes which include recreation and fisheries. Let us hope that the Federal Health Service and our State pollution control authorities do not make this mistake now, as it will be disastrous at this late date in the history of the fishery and recreational programs on the lower Columbia River.

Gentlemen, that concludes that. I have two other observations, in listening to some of the other things that have transpired previously.

One is that we do not seem to be too concerned about the Willamette River discharge. Yet, by the same token, the Oregon fishermen are increasing in large numbers on the Washington shores because it's better fishing for them where they don't have to come into the direct pollution at the mouth of the Willamette. That certainly has a bearing. I believe that the Willamette flow contributes in a major aspect to our entire lower Columbia pollution problem.

Thank you for listening.

CHAIRMAN STEIN: Mr. Everts, do you have any questions or comment?

MR. EVERTS: No, sir.

MR. FOSTON: I have nothing.

CHAIRMAN STEIN: Mr. Miller?

MR. MILLER: Nothing.

CHAIRMAN STEIN: I'd like to ask you a question. I don't know, maybe we're getting to a difference of opinion, but you said that there was serious interference, as I recall it, with net fishing and commercial fishing in the lower Columbia River by this sphaerotilus.

MR. PRICHARD: That's right.

CHAIRMAN STEIN: Yet we have a statement here just previous from Mr. Baker of Weyerhaeuser, and he says, and I quote:

"Like other users of the waters of the Columbia, the gillnetters should expect to experience some inconvenience and expense in accommodating their use to competing uses."

Do you agree with that statement?

MR. PRICHARD: I believe that our waters are to be used by all people, and it belongs to all of the people. I believe you have entered here in evidence, Mr. Chairman, pictures that will refute any such statement and that will show you the condition of nets. I have attended commercial fishermen hearings in the lower river, one in particular at Cathlamet, where the pictures of the nets, which you have in evidence here today, were displayed before us, and in talking to each and everyone of the fishermen, it's a deplorable condition when nets sink from sphaerotilus. It makes it inoperative.

CHAIRMAN STEIN: Thank you.

MR. MILLER: Are there any other representatives from the Washington side that care to make a speech?

...There was no response...

MR. MILLER: I'd like to make one statement in conclusion.

I know that there are many of you representing all the various interests in this thing, who undoubtedly would have liked the opportunity to question some of the people who have made statements here on some of the statements that were made. In talking about this with Chairman Stein yesterday, he pointed out that, if we permitted an open session of questions following each speaker, undoubtedly this conference would go on for a week, as it probably would, and we probably wouldn't gain too much by it anyway.

I do want to assure the people on the Washington side that all the statements made here today will be included -- am I correct, Mr. Chairman?

CHAIRMAN STEIN: That's right.

MR. MILLER: -- in the summary and statement of the conference, and the report of the conference to be put out at a later date. I want to assure all the interests of the Washington side that, if the information contained therein, is to be used in making decisions by the Washington Commission, you will be given an opportunity, if you're affected by any of these decisions, to comment on any statements made. You may also be assured that we will review and check the statements that have been made if we're going to make decisions based on them.

With that, Mr. Chairman, unless someone else has some comments, we will close our presentation.

CHAIRMAN STEIN: Thank you. I'd like to just clarify this. We will put out two documents after this conference. One will be a summary, which will be a very short summary. The other will be a verbatim transcript, and it will contain all the statements, and that will be available to you. We find that that is the best way to handle this, so you can base future actions or determinations on exactly what was said.

Now, I said we would leave at 4 o'clock, and it's almost that now. Tomorrow we are going to take up the statements from Federal agencies and have a discussion of the conferees and come to some conclusions. Then we will summarize.

Before we close, I would like to ask the representative from the Corps of Engineers to give us a statement today because he will not be available tomorrow, and, without objection, I would like to call on the representative of the Corps of Engineers at this time before we recess.

MR. TERRY: Thank you, Mr. Chairman.

Mr. Chairman, conferees, ladies and gentlemen, my name is Allen Terry of the Operations Division, Corps of Engineers, Portland District. The District Engineer has asked me to make a very brief resume of the facets of the problems affecting our operations.

The Corps of Engineers by the Oil Pollution Act of 1924 and the River and Harbor Act approved March 3, 1899, is directed to prevent the dumping of oil or refuse into the navigable waters of the United States primarily to protect navigation.

Pollution of the navigable waters within the Portland Engineer District presents two major problems affecting navigation. These will be discussed separately in their application to the lower Columbia River.

1. The Oil Pollution Act of 1924 makes it unlawful for any person to discharge, or suffer, or permit the discharge of oil by any method, means or manner into or upon the coastal (tidal) waters of the United States from any vessel except in case of emergency imperilling life or property or unavoidable accident, collision, or stranding.

Oil pollution has in the past been serious in the harbors of the lower Columbia River, but at present violations are extremely rare. Crude oil spills can be very destructive to fish and wild fowl, expensive to remove from pleasure and other water craft, and completely ruinous to beaches for recreational purposes.

Accumulation of crude or other oils upon docks and other marine installations definitely aggravates the chances of a major harbor conflagration. Removal of these accretions of oils from wharves and similar structures is practically impossible.

The astronomical increase in the number of sports craft over the past decade makes spilling of oil a serious violation. Crude oil, especially when spilled in a tidal stream, will necessitate cleaning and repainting several hundred or perhaps thousands of these sport craft.

Gasoline or diesel oil spills are extremely dangerous in a harbor from the standpoint of a major fire which would be impossible to quell once the flames attack wooden sub-structures of wharves and docks.

Regulations require that contents of ships' bilges or other waste oils be discharged at least 50 miles at sea or by special protective means while in harbors. Most oil docks and tankers are now equipped with filters to reclaim oil, making discharge from bilges free of pollutants.

Cases of accident, collision, or gross carelessness still are possible and when they occur steps must be taken immediately to remove oils from the water surface of the harbor. Posters outlining the proper procedure and reporting of such incidents have been posted on all major docks. Through the cooperation of the United States Coast Guard and Port authorities the reported cases of oil pollution in the lower Columbia River have become exceedingly rare. In the Portland area, prompt and vigorous action by the harbor police has improved the overall situation materially.

2. Section 13 of the River and Harbor Act of 1899 prohibits the deposit of any refuse matter of any kind or description, except certain liquids, whereby navigation shall or may be impeded or obstructed. Penalties are provided for convictions of violators.

Drift and debris in the lower Columbia River and other estuaries and its definite hazard to navigation remains a serious problem to the Corps of Engineers. Loss of or serious damage to a ship's propeller by striking a submerged object requires dry docking, inspection and the loss of several days of effective time. An economic loss of many thousands of dollars results from each accident of this type.

Water borne commerce on the lower Columbia River involves an annual movement of approximately 22 million tons transported in approximately 2,000 deep draft ships, as well as many barges and other lighter draft vessels.

There are an estimated 15,000 pleasure craft of all sizes and types which use the lower Columbia River for recreational purposes.

Most of the drift and debris upon this stream is directly or indirectly attributable to man's activities. Logging upon the headwaters of numerous tributaries and seasonal movement of new and old drift downstream during flood seasons accounts for a great share of these deleterious materials. Marine construction activities and lumber and plywood mill operations are aggravating this problem of debris control. The short waste sections of peeler logs, known locally as "lily pads", are particularly dangerous to small pleasure craft. These pieces of debris float almost level with the water surface making detection almost impossible until struck by boats.

The Portland Engineer District has recently assigned an employee whose principal duty is to investigate and report upon violations of Federal regulations in regard to pollution of navigable waters. Improvement of conditions has been secured, but a tremendous job of education and enforcement still remains to be done. Increase of river traffic, especially sport craft, will aggravate this problem.

Policing of rivers and harbors of the Portland Engineer District involves navigable portions of the Columbia and Willamette Rivers, fourteen coastal estuaries, and approximately 400 miles of navigable tributaries to coastal harbors. It can readily be seen from the foregoing data that the Corps of Engineers is not staffed to continually or adequately patrol navigable waters within its boundaries.

Estimates of damages caused to craft of all types is almost impossible to ascertain, but it is acknowledged to be considerable and increasing in many areas.

Solution of this problem of stream pollution affecting navigation can be greatly assisted by the following steps:

a. Control of logging methods on the watersheds of tributary streams. Steps are now being taken by State and other public agencies to regulate logging in an effort to eliminate debris which would later pollute streams.

b. An increased and continuing campaign of public education to secure cooperation of industries and other agencies to reduce these economic losses which result from debris causing damages to boats.

c. More strict enforcement of regulations and faster prosecution of flagrant violations.

d. Education of the sport boating public as to its responsibility to operate craft at reasonable speeds and with mature judgment. A great percentage of damages to pleasure craft in striking debris could be eliminated by operators realizing the dangers and operating in a sane manner.

It is encouraging to see that cooperative efforts are being made to restore our streams to their former beauty and cleanliness and improve them for navigation and recreation.

We appreciate this opportunity of presenting this statement in brief on this navigation facet of the stream pollution problem.

Thank you.

CHAIRMAN STEIN: Mr. Everts, do you have any comments or question?

MR. EVERTS: Nothing.

CHAIRMAN STEIN: Mr. Poston?

MR. POSTON: Nothing.

CHAIRMAN STEIN: Mr. Miller?

MR. MILLER: No, sir.

CHAIRMAN STEIN: I'd like to make one comment here for clarification, and I'd like to be corrected if I'm wrong. As I understand it, the Oil Pollution Act of 1924 gives the Corps of Engineers jurisdiction over waters that are in the nature of coastal or tidal. I understand also that this applies to the Columbia River, that is, the portion of the Columbia River we have under consideration here. Section 13 of the River and Harbor Act of 1899, on the other hand, applies to all navigable streams.

So, I think, as far as these waters are concerned, there is concurrent jurisdiction.

MR. TERRY: Both would be applicable.

CHAIRMAN STEIN: Let me turn this over to Mr. Miller.

MR. MILLER: I indicated before that we had sent letters to a number of agencies, inviting them here. I would like to get in the record the list of the individuals and the agencies who were invited to attend.

Also, in view of the fact that you will re-open the conference tomorrow to participants, I wonder if we can have the privilege, if we can get a statement from our Game Commission or other Washington interests in the morning, of getting them in the record.

CHAIRMAN STEIN: Let this list appear in the record at this point at the end of Mr. Miller's remarks, rather than as an attachment.

---oOo---

...Following is list of individuals and agencies to whom Mr. Miller directed letters of invitation to appear at the conference, dated August 12, 1958...

Milo Moore, Director
State Department of Fisheries
4015 - 20th Avenue West
Seattle, Washington

Dr. Bernard Bucove, Director
State Department of Health
Smith Tower
Seattle 4, Washington

F. O. Boylon, Manager
Crown Zellerbach Corp.
Camas, Washington

D. C. Ellsworth, V. Pres.
Columbia River Paper Mills
1029 S. W. Alder St.
Portland, Oregon

Manager
Longview Fibre Co.
Longview, Washington

L. D. Jones, Manager
Washington Canners
Box 30
Vancouver, Washington

City of Camas

Town of Ridgefield

Town of Kalama

City of Longview

Town of Ilwaco

John A. Biggs, Director
State Department of Game
General Administration Building
Olympia, Washington

State Parks Department
100 Dexter Avenue
Seattle, Washington

E. N. Wennberg, Manager
Weyerhaeuser Timber Co.
Pulp Div., Longview

John Hilstrom, Manager
N.W. Div., Cal. Packing Co.
Box 2109
Portland 14, Oregon

W. C. Rodenberger
10704 N.W. Lower River Road
Vancouver, Washington

Tom Hall, Chairman
Pollution Committee
Wahkiakum County Planning Council
Skamokawa, Washington

City of Vancouver

Town of Woodland

City of Kelso

Town of Cathlamet

Howard Nelson
2313 E. 10th St.
Vancouver, Washington

Warren Neal, Commodore
Vancouver Yacht Club
4113 Fir Street
Vancouver, Washington

Ted Hart
125 S. Street
Vancouver, Washington

Roy Radow
1701 S. Access Road
Vancouver, Washington

Charles W. Groth
612 W. 10th
Vancouver, Washington

Fred Strong
Strongs Moorage
Woodland, Washington

Larry Keller
Kelly Tire Co.
Longview, Washington

G. L. Thompson
Keystone Packing
Ilwaco, Washington

Great Western Malting Co.
Box 1507
Vancouver, Washington

W. W. Steinhoff
3101 Fourth Plain
Vancouver, Washington

Roy Shanks
1801 E. 1st St.
Vancouver, Washington

J. W. Arrasmith
900 W. 15th Street
Vancouver, Washington

Gerald Barker
P. O. Box 583
Ridgefield, Washington

Ed Mainwaring
Hotel Broadway
Longview, Washington

Ron Tuttle
1202 Commerce
Longview, Washington

Melvin Lebach
Chinook Packing Co.
Chinook, Washington

---oOo---

CHAIRMAN STEIN: Now, tomorrow we will pick up and have any further statements by participants both from Oregon and Washington who did not appear or could not be here today.

Further, we will have our Federal agencies, who will be here and be given an opportunity to make statements. There will be a discussion by the conferees of the problem. The conferees will then attempt to arrive at conclusions, and then we will summarize the conclusions in order to determine whether the conferees are agreed as to the summary.

Now, at this point, I want to thank you all for coming and hope you see your way clear to be here again tomorrow.

We will now stand recessed until 9 o'clock, tomorrow, at the same place.

...Whereupon, at 4:05 o'clock, p.m., Wednesday, September 10, 1958, the conference adjourned, to reconvene at 9 o'clock, a.m., Thursday, September 11, 1958, at the same place...

---oOo---

THURSDAY SESSION

...Whereupon, the Conference was reconvened at 9 o'clock, a.m., Thursday, September 11, 1958...

CHAIRMAN STEIN: The conference in the matter of pollution of interstate waters of the lower Columbia River is reconvened after a recess from yesterday.

We will, as announced yesterday, continue with the agenda. Hopefully, we will push to get through by 12 o'clock at the latest today. The plan for this morning is to have statements by Federal agencies and other participants invited by the State of Washington and the State of Oregon, who have not had an opportunity to be heard before, and at that point we will call a short recess. Following the recess, we will have a discussion by the conferees of the material brought forth at the conference, try to arrive at some conclusion, and then summarize the conference.

I think one of the criticisms we had of the conference yesterday was that we didn't have any stretch period, and we had prolonged and somewhat dry sessions. I think the sessions were a little short. We are going to try to take care of that today. I don't know when the recess might come. It might come a little early in the game, but I think the recess will be designed to let you go out and get a cup of coffee and sort of relieve the tedium of listening to all this data.

Now, again I want to indicate that under the law we are required to prepare a summary at the end of the conference, covering three points -- at least three points, and these are:

Occurrence of pollution of interstate waters subject to abatement under the Federal Act; adequacy of measures taken to abatement of that pollution; and nature of delays, if any, being encountered in abating the pollution.

It would be useful, if the persons making the statements keep that in mind in preparing their statements.

Before we call on the Federal agencies, we would like to canvass the States and see if they have any more people who would like to be called.

Mr. Miller, do you have any people from Washington?

MR. MILLER: No one has so indicated. Is there anyone from Washington who cares to make a statement at this time?

...There was no response...

MR. MILLER: Apparently not, Mr. Chairman.

CHAIRMAN STEIN: Thank you, Mr. Miller.

Mr. Everts, is there anyone from the State of Oregon who might care to make a statement at this time?

MR. EVERTS: Mr. Chairman, it is my understanding that a representative of the city of Portland would like to make a statement this morning. I would like to introduce to the conference Mr. Gordon Burt, City Engineer for the city of Portland.

CHAIRMAN STEIN: Thank you. Again, before you start, Mr. Burt, may I indicate that anyone who wishes to make a statement should come up to the lectern. Then the procedure is for such person to make the statement, and the conferees may then make comments or ask questions.

Mr. Burt.

MR. BURT: Thank you. Mr. Chairman Stein, conferees, ladies and gentlemen.

The city of Portland is active in pollution control work in this area and, in cooperation with the Oregon State Sanitary Authority, has expended some 19 millions of dollars in pollution control work in an effort to improve the sanitary quality of the Willamette and Columbia Rivers. Our projects are not complete.

We are asking the voters in the election this November to approve a levy to provide five million dollars for completion of Portland's program of intercepting of these discharges and treating the same. In addition, we are also going to ask the voters this fall to approve a five million dollar levy to rehabilitate some of our older sewers and to enlarge some, which, because of expansion and growth of the city, are now reaching a point where they are no longer of sufficient size to serve.

It is our feeling that completion of our project by intercepting all the raw sewage, which will include probably an industrial waste treatment facility in the Smith Lake area and a domestic sewage treatment plant at Linnton, are of paramount importance.

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We have conferred this year with the Oregon State Sanitary Authority in the development of this program and are hopeful that funds will be made available this fall to move along in the direction which I have indicated.

At the present time, flows, which are being treated in the primary sewage treatment plant and discharging the effluent to the Columbia River, have been increasing about three million gallons per day each year. It moved from an average daily flow of 54 million gallons a day to 57, and this last year, which we just completed June 30th, our average yearly flow was 60 million gallons a day, being treated at the sewage treatment plant on Columbia Boulevard.

We operate a system of 19 pumping stations in addition to this major sewage treatment plant.

That's the completion of my statement, Mr. Stein. I will be glad to answer any questions you might have.

CHAIRMAN STEIN: Do you have any questions?

MR. MILLER: No questions.

CHAIRMAN STEIN: Mr. Everts?

MR. EVERTS: No questions.

MR. POSTON: I have nothing.

CHAIRMAN STEIN: I would like to ask one. As I understand it, you are giving your waste primary treatment at the present time?

MR. BURT: That is correct.

CHAIRMAN STEIN: Without chlorination?

MR. BURT: Without chlorination.

CHAIRMAN STEIN: Are there plans to go beyond primary treatment in the city now?

MR. BURT: Our next stage in expenditure of funds in construction of facilities is to build two additional sewage treatment plants, and about nine or ten pumping stations and intercepting sewers to complete the project of intercepting all of the raw waste. That is not complete at the present stage, and we feel that that is of such urgency that it demands first attention.

CHAIRMAN STEIN: What I was trying to get at was these new sewage treatment plants. They will also provide primary treatment, is that correct, or will they do more than that?

MR. BURT: The Oregon State Sanitary Authority is now requiring complete treatment for any discharge, any effluents discharged into the Willamette. These two proposed treatment facilities would discharge into the Willamette and would be in the nature of complete treatment.

CHAIRMAN STEIN: That is, primary and secondary treatment?

MR. BURT: Yes.

CHAIRMAN STEIN: Are you planning to discharge any raw effluent by additional outfalls, that is, outfalls from that sewage treatment plant, into the Columbia River, directly into the Columbia River as a result of your new program?

MR. BURT: No, there will be no additional outfalls into the Columbia River.

CHAIRMAN STEIN: But it would be expected that the loading of the Columbia River would be increased because of that?

MR. BURT: Probably not because there are raw discharges into the Willamette now which enter the Columbia, and by intercepting them and treating them, we will reduce that.

CHAIRMAN STEIN: Now, here's something for our information. We are hearing here about a tri-county arrangement. Are you folks in Portland involved in that plan?

MR. BURT: To a degree, we are. We've been active in promotion of the tri-county plan. Mr. William A. Bowes, Commissioner of Public Works, has been one of the principals interested in promotion of the tri-county plan, and we have been negotiating with him for joint use of sewage treatment facilities. These facilities again will be complete treatment to eliminate heavy discharges of pollution into the Tualatin River, and from the Tualatin River into the Willamette River, and then, of course, downstream into the Columbia River, and it is hoped that the city will join with the tri-county authorities, and we have money available at the present time to jointly build an intercepting sewer and to jointly build a sewage treatment facility.

CHAIRMAN STEIN: As I understand it then, the effluent, the treated effluent of the tri-county facilities will eventually find its way into the Willamette and not into tributaries of the Columbia other than the Willamette?

MR. BURT: That is correct.

CHAIRMAN STEIN: Now, are there going to be any of these treatment facilities within the city limits of Portland? In other words, are you going to accept waste from outside your city limits and treat it within your city limits, or at another plant under your jurisdiction?

MR. BURT: We have and are doing that now. We're cooperating with the counties to this extent, that, with the lie of the land, the natural drainage indicates it's most economical to treat flows from the city in a county plant that is contemplated, and, conversely, where it's convenient for a section of the county lying outside of the city limits to have the sewage treated with the city system. We have contracted with them and are installing sewers for that purpose at the present time.

CHAIRMAN STEIN: You have no problem in exercising jurisdiction in the operation of a plant outside your city limits, and you share that plant with someone else, do you?

MR. BURT: We seem to be able to do that, and actually our own sewage treatment plant was built outside of our city limits, and then we immediately annexed it to the territory to bring it in.

CHAIRMAN STEIN: Thank you. I'd like to, if I might, see, if in summary, we can set up this picture. As I see it, the improvements are being made in the Portland system and in the surrounding area, which would provide primary and secondary treatment for all wastes which go into the Willamette River or a tributary thereof. However, there is a portion of sewage and domestic waste treated by the plants under the jurisdiction of the city of Portland, which only receives primary treatment, and the effluent from this treatment is discharged into the Columbia River, and there are no present plans to at this stage go and raise the level of treatment for the wastes, from which the effluent is discharged directly into the Columbia. Is that correct?

MR. BURT: That is correct, Mr. Stein. You made an excellent summary. We have made some preliminary cost studies of coordination which would result in anticipated operating charge of between 100 and 200 thousand dollars a year. We feel that all funds that we can make available at this time should go into completion of our system, of our program of intercepting all raw sewage discharged.

CHAIRMAN STEIN: Thank you, Mr. Burt.

At this point, I would like to turn this mike to Mr. Miller.

MR. MILLER: I just received a note indicating that there is a gentleman from the Washington side that has an exhibit to present to the conferees and the conference. I doubt that you will want to insert this one in the record, Mr. Chairman. I think it comes more in the nature of an appendix.

Will Mr. Charles Schram of Columbia River Packers come up, please?

MR. SCHRAM: Should I bring it in?

MR. MILLER: You indicated you had an exhibit.

MR. SCHRAM: I'll get it. It will take five minutes.

MR. MILLER: Do you mind if we proceed then, and you can follow the next speaker perhaps. Is that all right, Mr. Chairman?

CHAIRMAN STEIN: Yes. We'd like to at this point move on and call for statements by Federal agencies. For this purpose, we will ask Mr. Poston, from the Public Health Service, to call on the Federal agencies.

MR. POSTON: Thank you, Chairman Stein. I have not heard from all of these Federal agencies. So, I think I will call them in the order in which the invitation was issued to them.

Is there anyone here from the United States Geological Survey who wishes to make a statement?

...There was no response....

MR. POSTON: The Soil Conservation Service?

...There was no response...

MR. POSTON: The 13th Naval District?

MR. GLEASON: Mr. Chairman, conferees, ladies and gentlemen, I am Robert J. Gleason, District Sanitary Engineer for the 13th Naval District. I am here as the representative of the Commandant, 13th Naval District, at the invitation of the United States Public Health Service.

My comments will be brief as I know there is much to be accomplished this morning.

First of all, I wish to convey the Commandant's appreciation for the invitation to attend this important conference on interstate pollution problems in the lower Columbia River basin. The Navy Department is vitally interested in any pollution problems affecting the health and well being of military and civilian personnel and wishes to cooperate with local, State and Federal regulatory agencies on problems of mutual concern.

The 13th Naval District includes the States of Washington, Oregon, Idaho and Montana. In this area, there are presently more than 50 Naval activities, ranging in size from the Puget Sound Naval Shipyard at Bremerton, Washington, to smaller installations, such as the Naval Reserve Training Centers at various locations throughout the four States. There are three Naval activities in the Columbia River basin, namely the Naval Reserve Training Center at Swan Island, Portland, and at Longview, Washington, respectively, also the Naval Station at Tongue Point, Astoria, Oregon. Although the Naval Station at Astoria is somewhat west of the limits covered in Mr. Kittrell's report, it is located in the lower Columbia River basin.

In March of 1958, the Naval Reserve Training Center at Swan Island discontinued the use of septic tank treatment facilities after making connection with the city of Portland sewage system. At Longview, Washington, sewage from the Naval Reserve Training Center is discharged to a septic tank in the uplands and is dispersed in a sub-surface field. At the Naval Station at Astoria, Oregon, sewage treatment facilities, consist ing of primary sedimentation, separate sludge digestion, and chlorination of the sewage effluent before discharge into the waters of Cathlamet Bay are provided.

Several years ago, in 1948 to be exact, the 13th Naval District made a complete study of the Bear Creek water supply works of the city of Astoria, Oregon, from which the Naval Station purchases its water supply. This study was made in cooperation with the city engineer as a result of doubts expressed as to the adequacy of the Astoria supply to continue to supply Navy requirements in addition to city demands. Modifications and improvements made by the city as a result of this study removed any further threat of water shortage.

It is of particular interest to note here that studies made by the Navy at that time of the waters of the Columbia adjacent to Tongue Point indicated that a suitable water supply could be developed by the installation of coagulation infiltration facilities, followed by chlorination.

This concludes my comments at this time, and, in closing, I wish to thank the Public Health Service, as well as the other conferees on behalf of the Commandant, 13th Naval District, for the opportunity of attending this conference.

CHAIRMAN STEIN: Thank you, sir, for an excellent statement.

Do you have any questions?

MR. EVERTS: Nothing, Mr. Stein.

MR. POSTON: I have none.

MR. MILLER: No questions.

MR. POSTON: Do you want to go ahead, Mr. Miller?

MR. MILLER: Mr. Schram, do you care to show your exhibit now?

CHAIRMAN STEIN: Do you want to identify yourself first, Mr. Schram? Perhaps in showing the exhibit, you can talk and describe it, so we can get it for the record.

MR. SCHRAM: I'm Schram from Columbia River Packers, Vancouver plant. We had permission from the fisheries to place this piece of net in the water yesterday.

...The net was displayed...

MR. SCHRAM: It was drifted approximately two hours, and we cut just a short piece to show you what it really is. We lost a lot of it dragging it over the side of the boat. That's heavy.

CHAIRMAN STEIN: Thank you. Are there any comments or questions?

MR. MILLER: Just where was this taken, Mr. Schram, for the record?

MR. SCHRAM: On what we call the Fisher Drift approximately six miles up from the Interstate Bridge.

CHAIRMAN STEIN: Do you think you could point that out on the map up here, where that might be?

MR. SCHRAM: (Indicating on map) It's just below Camas, between Camas and Vancouver there.

CHAIRMAN STEIN: Thank you. Now, may I ask you, Mr. Schram: Is that typical of conditions that you find during the fishing season?

MR. SCHRAM: Quite often, especially in the low water, the lower stages of the water.

CHAIRMAN STEIN: Well, when you say "quite often", how long does the fishing season last?

MR. SCHRAM: Well, we have three to four seasons a year, and they're open three weeks at a time.

CHAIRMAN STEIN: Well, during these three week periods let's assume that you make, as the testimony here indicated, perhaps four passes a day. During the three week period, how many of these days would you find conditions like that to exist?

MR. SCHRAM: In May and June, when the river is fairly high, you don't run onto too much of it. Therefore, there's a supply of water to sluice it out, and that's only at times too. It just depends on when they release it. Then they will give it up for a few days, and then it will become clear until the water is, say, around eight and nine and lower, and then it's just solid.

CHAIRMAN STEIN: Is that a nylon net you've been using

MR. SCHRAM: This is linen, this particular piece.

CHAIRMAN STEIN: How do you get that stuff off of there? What do you do?

MR. SCHRAM: It takes a long time, three hours of good old hard solution with a hose, and possibly racking it out and leaving it dry and shake it out after it's dry, if you can stand the smell. It takes a long time to get it out. You make one drift a night, and you're done.

CHAIRMAN STEIN: In other words, if you make one drift and you get a net clogged with these slimes, you feel that you can't make another drift that night?

MR. SCHRAM: Your net is too heavy. It goes right to the bottom.

CHAIRMAN STEIN: Thank you, Mr. Schram. Let's see if any of these other gentlemen may have questions or comments.

...There was no response...

CHAIRMAN STEIN: Thank you. At this point, we will continue with the Federal agencies again, and Mr. Poston.

MR. POSTON: The Bureau of Reclamation?

...There was no response...

MR. POSTON: United States Coast and Geodetic Survey?

...There was no response...

MR. POSTON: United States Coast Guard?

COMMANDER ELLIOT: Mr. Chairman, conferees, ladies and gentlemen:

I only have a few brief remarks. The Coast Guard activities in this area --

MR. POSTON: Would you identify yourself, please?

COMMANDER ELLIOT: Yes. I'm Commander Elliot, Officer in Charge of Marine Inspection, and Captain of the Port of Portland.

The Coast Guard activities in this area are mostly enforcement activities. Part of our obligation is to investigate acts of misconduct, negligence, and so forth, of personnel on merchant vessels, and any pollution occurring from merchant vessels, on which licensed or documented men are employes, is handled by our office.

We follow through and take suspension or revocation actions against the personnel involved in such violations. The Coast Guard also investigates oil pollution incidents for the Corps of Engineers. It's up to the Corps of Engineers to determine whether further prosecution should take place after our investigation by the Coast Guard has been completed.

That, in substance, is the activity of the Coast Guard in the local area as far as pollution is concerned, and that's about all we have to say.

CHAIRMAN STEIN: Thank you, sir. Do you have any comments?

MR. MILLER: I haven't any.

MR. EVERTS: No, sir.

CHAIRMAN STEIN: Mr. Poston?

MR. POSTON: No, sir. The United States Forest Service?

MR. BULLARD: Mr. Chairman, conferees, ladies and gentlemen, I am W. E. Bullard, of the Division of Watershed Management, Regional office of the Forest Service here. Our territory covers the States of Washington and Oregon.

I have listened with considerable interest to the several statements presented to the conference thus far, and have noted some references to matters that concern the Forest Service. Although we feel that the relation of the National Forests to the lower Columbia River is not direct, we certainly recognize that tributaries draining National Forests feed the Columbia, and that the land management and the land cover conditions do affect water quality. Our National Forest management objectives include protection of the water resource as the prime element. Our National Forest practices and operations are geared to this objective as best we know how.

I can say we are pleased to see this concerted group attack on the pollution problem. We've found such interagency efforts to be successful in other fields, and we expect that it will be in this, and we certainly will be happy to cooperate insofar as we can.

CHAIRMAN STEIN: Thank you, Mr. Bullard. Would you wait and see if there are any comments or questions?

MR. MILLER: I have none.

MR. EVERTS: Nothing.

MR. POSTON: I have none.

CHAIRMAN STEIN: Thank you, Mr. Bullard.

MR. BULLARD: Thank you.

MR. POSTON: I believe we have a statement by the United States Fish and Wildlife Service.

Mr. Edward Perry, Program Director of the Columbia River program. I believe Mr. Perry has come in. Will you come up, please?

MR. PERRY: Pollution has a direct bearing on Columbia River runs of salmon and steelhead, which are of such importance to the economy of the Pacific Northwest. The Federal Government has spent some 17 million dollars in the past few years in cooperation with the State fishery agencies and on hatcheries to maintain the anadromous fish runs in the Columbia River system. Nearly all of this has been spent in the lower Columbia basin. Additional millions have been spent on research, including some studies on water quality.

The Fish and Wildlife Service is definitely interested in any action that will result in reduction of the pollution in the Columbia River and its tributaries with the view toward restoring the water in this great river system to its former productivity.

One of the prime requisites of our Columbia River fishery development program has been adequate control of pollution. We are not a pollution control agency. However, our interest has been intent, and we've always endeavored to encourage adequate study and control of pollution in the Columbia basin. We are particularly interested in any studies that are undertaken to determine the types, seasonal occurrence, and effects of pollution. We believe that such studies should be sufficiently broad to include the effects of pollution on all aquatic organisms, as well as the effect on the general public health. We urge that such studies be continued as a normal procedure on the Columbia River, so we can detect problems as soon as they arise and so that we can produce evidence that will obtain satisfactory control.

The Fish and Wildlife Service will willingly cooperate with all other agencies with a view towards resolving numerous problems associated with pollution and control in the Columbia River system.

Our particular concern at the moment in the lower Columbia River are effluents that encourage growth of sphaerotilus and increase the temperature of the water. The sphaerotilus problem is recognized as being serious because of its interference with the gill net fishery in the river. We have observed this problem in the operation of our own experimental nets in the river, as well as those of commercial fishermen. The temperature problem is not so conspicuous, but it is becoming more important. In normal years, there is little concern, but, during years of low flow and high temperature, and increases in temperature caused by large plants such as that at Hanford, may have serious effects on the entire fish run.

In this bureau, we are especially worried about the high incidence of disease in salmon associated with high temperatures. In essence, we feel the salmon population of the Columbia is in serious jeopardy, and all harmful influences should be eliminated and high standards maintained to assure them perpetuation.

We do urge stringent control on all sources of pollution of the Columbia River and a continuous monitoring system to assure its maintenance.

Thank you.

CHAIRMAN STEIN: Thank you, Mr. Perry. Do you have any comments or questions?

MR. MILLER: I'd like to ask whether the Service has any direct evidence of effects on fish life that would be beneficial to the several control agencies, such as fish kills or effects on food changes, or anything of that nature.

MR. PERRY: We have passed on what limited factual information that we have had to Mr. Kittrell for the preparation of his report, and we have not discovered anything in addition to that that would be emphatic and interesting to you right now.

MR. MILLER: That's all.

CHAIRMAN STEIN: Mr. Everts, do you have any questions?

MR. EVERTS: No.

MR. POSTON: I have none.

CHAIRMAN STEIN: Mr. Perry, thank you for an excellent statement. I would like to point out that we, who are interested in pollution control, also watch temperatures of the water, and how the changes in temperature under certain circumstances has a detrimental effect on aquatic life, and how it can be severely damaged by legitimate water uses, as regards the fish habitat, but I notice that you highlight your temperature changes to the Hanford Works.

The stretch of the river that we're dealing with is somewhat outside the scope of that in the conference that we've undertaken, and it's outside the scope of the portion of the river that we've undertaken to deal with at this time.

MR. PERRY: I realize that.

CHAIRMAN STEIN: The reason we do this is not that we don't recognize the potential problem in other areas -- we believe they are rather serious problems -- but, in order to intelligently deal with the problem, we have to sort of break the river down into manageable portions. Otherwise, the problems get so complex and so diffuse that it's very difficult to have an intelligible result in a conference, or something of that sort that might evolve from a conference.

I will say that the Public Health Service is keeping the temperature, as well as other problems from Hanford, under surveillance in the Columbia River, and it's closely watched, and the effects of it, but what I would like to know is: Do you relate temperature changes to any installations which may be at Bonneville and below?

MR. PERRY: Not any outstanding relationship there, Mr. Chairman. Particularly, Hanford is the place that we are worried about, and I realize that's outside the area that you are immediately concerned with. However, it affects this area. It affects everything downstream, and I think that you should give consideration to that, even though the source of that effluent is not in this area that you're concerned with.

CHAIRMAN STEIN: Well, particularly, we're interested in the statement that you have made here in recognition of your status as an objective fact-finding expert agency in the field, that this sphaerotilus problem is recognized as being serious because of its interference to the gill net fishery in the river, and I want to thank you for making a statement on that because that is one of the areas that the conferees are trying to reach a conclusion on. Thank you very much, Mr. Perry.

MR. PERRY: Thanks very much. I appreciate the opportunity.

MR. POSTON: I wonder if there are any other representatives of Federal agencies that wish to be heard at this time.

...There was no response...

MR. POSTON: If not, Mr. Chairman, I believe that concludes the statements by Federal agencies today.

CHAIRMAN STEIN: This sort of concludes the statements by the participants, and, before we recess, I'd like to take this opportunity to give anyone in the audience, who feels he wants to make a statement at this time, an opportunity to make one, if he feels he has anything relevant or pertinent to add to the discussion, because, after the recess, we will have a discussion of the problem by the conferees and come to conclusions.

Is there anyone who wishes to make a statement at this time?

...There was no response...

CHAIRMAN STEIN: If not, we will recess until 10.30. The conference stands recessed.

...A short recess was taken...

CHAIRMAN STEIN: The conference is reconvened.

We would like to have the chairman of both Commissions, Mr. Coe and Mr. Wendel, sit up here during these discussions and conclusions of the conference.

Before we begin though, I should like to announce that we received a communication and petition from the Wahkiakum Planning Council -- I hope my pronunciation is correct -- and I think we will put the entire communication without objection in the record. However, I would just like to read the last two paragraphs of the letter, which may add a little new light. Generally, the other points have already been covered by other statements of other participants in the conference.

...In accordance with the Chairman's request, the letter of the Wahkiakum Planning Council, dated September 9, 1958, addressed to the Chairman of the Conference, signed by Thomas C. Hall, Chairman, Pollution Committee, is reproduced in its entirety, as follows:...

"Although we notified the Pollution Control Commission of the State of Washington that our group would present a short oral statement at your conference, we now find that we are unable to appear in person. We are, therefore, requesting that this letter be made a part of your record on this subject of vital interest to us.

"The problems respecting the cause and effect of pollution of the Columbia River as it affects Wahkiakum County, Washington, are perhaps somewhat disproportionate to the county size. While our problems are no different perhaps than any other typical area of similar size along the Columbia River, we are perhaps a bit unfortunate in that our present economy is dependent in a large measure on the economic resources provided by the Columbia. Our citizens have noted with dismay the increasing pollution of the Columbia River and its detrimental effects on the fishing and recreational resources. We are, therefore, quite willing to assist in any way we can in combating this increasing problem.

"Our concern in pollution in the Columbia River is one of effect rather than cause. Wahkiakum County is largely a rural area, being a small county with an area of 269 square miles, predominantly forest covered. It borders the Columbia River on the south with more than 50 miles of river frontage.

"We have little or no industrialization which requires the use of the Columbia River as an instrumentality for disposal of wastes. Other than the use of the Columbia River by the Town of Cathlamet for sewage disposal, our contribution to the total polluted condition of the Columbia River is negligible.

"The economy of Wahkiakum County is based almost completely on three industries, namely logging, agriculture, and fishing. Out of the total county area of 172,160 acres, 81%, or 139,450 acres, is forest land. Little processing of forest products is carried on in Wahkiakum County, the county being chiefly noted for the timber grown and logged in this area. More than 60% of the forest lands of the county are owned by Crown Zellerbach Corporation and this firm has seen fit to process the forest products obtained from Wahkiakum County lands at other points along the river, principally at Camas, Washington, and St. Helens, Oregon, paper mills. The Columbia River is used as an avenue of commerce for the transportation of log rafts from the Wahkiakum County area to the factory sites upriver.

"The gross product value of these three industries in Wahkiakum County are as follows: Logging $2,700,000.00, Agriculture $1,369,367.00, and commercial fishing in Wahkiakum

County Area $321,350.00. In addition to the fishing carried on in the county area, our resident commercial fishermen range up and down the river in their fishing pursuits and the total income received by our resident fishermen in the Columbia River, although accurate figures are not available, must necessarily exceed a half million dollars.

"Although we shall not comment specifically on the detrimental effect which the increasing pollution of the Columbia River has or is having on our valuable salmon resources for the reason that specific information on this subject is available and undoubtedly will be presented by the departments of fisheries and game from both the States of Oregon and Washington, we must generally note that our local fishing industry is in an apathetic condition. Although our fishermen decreased in number and are being severely regulated as to their fishing seasons, the salmon population of the Columbia River has decreased in almost every category during the last 10 years. Our fishermen do not simply point the accusing finger at pollution for there are many other varied, complex causes of our salmon decline. It must be stated, however, that it is the general opinion of the people of this area that pollution is one of the greatest factors in the decimation of our salmon runs. Statistics, we believe, will bear out that the growth of the wood related industry (primarily pulp) has been in direct proportion to the corresponding decrease in the salmon population.

"During the last 10 years, our fishermen have particularly noted the ever-increasing presence of foreign matters in the nature of slime in the waters of this river. They have noted that, as the pollution increased, the capability and the life of their nets have been correspondingly decreased. It is conservatively estimated that the useful life of gillnets has been very substantially reduced up to 50% during the past few years apparently from pollution causes. The average gillnetter in this county will spend approximately $750.00 each year for replacement of gillnets where he formerly expended about 50% of this amount only as little as 10 years ago. When this increase in maintenance costs of gillnets is equated with the number of our fishermen, (approximately 120 resident commercial fishermen), it may be readily seen that commercial fishing costs in this area (discounting inflationary price increases) have increased more than $40,000.00 from the cause which the fishermen can only ascribe to the slime and foreign matter in the water which quickly weakens and destroys their nets.

"Various studies have been made of the problem. It appears, however, from a perusal of the various authoritative articles on this subject, that the primary problem of pollution is that of biological unbalance caused by waste deposits in the Columbia River. It appears further that the greatest single factor in creation of this imbalance is the dumping of wood sugars into the Columbia River, which, in turn, causes fungus growths bringing about the presence of slime and foreign matter in the river.

"While we largely point the accusing finger at the pulp industry, we do not and cannot take uncompromising position that the pulp industry should be removed from the Columbia River area. Not only is our county dependent principally on forest products for its economy, but it would seem clear that it is no answer that one industry must die or be severely penalized in order that the other might survive. We firmly believe, however, that research has discovered feasible means of reducing pollution to a safe minimum and that methods of production have been devised which will reduce the industrial wastes dumped in the Columbia River in order that the opportunities for preservation and increase of our salmon will be greatly enhanced.

"While the increasing pollution of the Columbia River has had its greatest immediate effect in relation to the commercial fishing industry, it is affecting our economic life in other respects. Wahkiakum County is fortunate in having a large State food-fish hatchery on the Elochoman River. Recently there was completed a half million dollar game fish hatchery on a tributary of this same river. Plans are now under way for construction of another fish hatchery on the Grays River. The value of these two streams for sport fishing is increasing. A check of steelhead records kept for several years show that the steelhead catch by the sports fishermen in the county has run from 2000 to 3500 fish annually. With the new fish hatchery just completed on Beaver Creek, a tributary of the Elochoman River, it is expected that this county will become one of the best steelhead areas in the State. In addition, brook trout and harvest trout fishing is good in this county. Further, substantial fish catches of other types of salmon are made in this area, and it is presently being extensively prospected for good sport fishing spots.

"Inasmuch as Wahkiakum County can expect little in the way of further industrialization, one of our chief economic hopes for the future lies in the development of the recreational opportunities which exist here. We believe that opportunity exists for the development of Puget Island and other points in the county into one of the recreational attractions of Southwest Washington. Plans are going forward for development of moorage facilities in Cathlamet. With the rapid increase in the number of pleasure boats for fishing or water sports, it becomes increasingly important to us that measures be taken to retard the use and abuse of the Columbia River as a sewage depository for human waste and the vast quantities of wastes being dumped by industries along the Columbia River.

"Our economic basis is unfortunately not diversified. Continued reduction of our fishing industry and an increase in the health-menacing condition of the waters of the Columbia River spells a real economic disaster for Wahkiakum County. We are hopeful, therefore, that some reasonable solution of the pollution problem may be quickly found and implemented in order to enhance the possibilities of an extensive and prosperous further development of one of our greatest Northwest natural resources, the Columbia River."

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CHAIRMAN STEIN: Then we have a petition, which we will put in the record, which says, and I quote:

"We, the undersigned citizens and commercial fishermen of Wahkiakum County, do respectfully petition and urge the United States Public Health Service to use its authority, assistance and influence in instituting a definite program and promote enabling legislation, both on a national and state level, to effectively arrest, curtail, and reduce pollution of the waters of the Columbia River and its tributaries. Pollution of the river has in the last few years become very evident and the presence of foreign matter in the waters of this river appears to be increasing each year. This pollution has seriously affected the undersigneds in the following particulars:

"(1) The useful life of gillnets has been very substantially reduced (up to 50%) during the past few years apparently from pollution causes.

"(2) The foreign matter in the water has reduced the capabilities of gillnets and has greatly increased the work of the average commercial fisherman.

"(3) The undersigneds are informed and believe that the fish producing capabilities of the Columbia River have been markedly reduced by pollution.

"(4) The waters of the Columbia River has become increasing unfit for human consumption and is rapidly becoming a health menace."

That is the end of the quote, and there are a number of signatures attached to this petition. I will give this to the recorder for purposes of the record.

Now, we would like to go on with the discussion of the hearing. First, I think we have to consider the requirements of the Act, and one of these requirements includes occurrence of pollution in interstate waters subject to abatement under the Act, (2) adequacy of measures taken toward abatement of pollution, and (3) nature of delays, if any, being encountered in abating pollution.

Now, I think we should, for the sake of uniformity, take these up in order, and, at the end of them, decide where we go from here.

Under the second point, that is, adequacy of measures taken toward abatement of the pollution, we should emphasize that we may want to expand this discussion somewhat up here because perhaps in the development of the statements given before the conference, sufficient attention has not been given to the accomplishments of the official agencies on both sides of the river and of the industries and municipalities concerned. I think in these conferences there is always a tendency to emphasize the work that still needs to be done, and yet not give due credit to the accomplishments which have taken place, and these accomplishments, I think, as we all know, and as is implicit in almost all the statements, have been conceded to have been considerable.

Obviously, if the industrial establishments or the municipalities were just dumping their wastes into the river raw without any treatment at all, or had done no work, the river would be a sorry place indeed.

Now, the first point we would like to discuss is the occurrence of pollution of interstate waters subject to abatement under the Act, and I think for purposes of discussion Mr. Kittrell has divided this into two parts, which seem to be a useful classification, one part dealing with possible bacterial pollution, or pollution containing pathogenic organisms which may be harmful to humans, and the other dealing with the industrial pollution.

Now, as to the first, if I might summarize and then ask for discussion on this point, the bacterial contamination of the river, if such occurs, appears to come from municipal sources, and notably the municipalities of Portland and Vancouver. Such discharge of wastes, it seems to me, at least causes the introduction of materials in the mainstem of the Columbia River, which provides a potential health hazard to people coming into contact with the river water, and these are both commercial and recreational users. Most of the commercial users, the fishermen, are engaged in one or another form of boating activities. The recreational users involve boating, swimming, water skiing, fishing, trapping, water fowl hunting, and so forth.

Now, we would like to ask the State agencies, one, if they are in general agreement with that as a conclusion from the statements adduced at the conference, or if they want to expand on it or modify it, or make any other comments on it.

Mr. Miller.

MR. MILLER: Well, we would certainly agree that there is a problem of bacterial contamination. I think it will take further study to determine and to fully evaluate this problem, to find out where these health menaces actually exist, and this, of course, involves the determination of where the river is used, and the uses involving bodily contact.

I think all we can say, as a general conclusion, is that there is a bacterial problem, but it needs evaluation up and down the river, tying the problem together with the uses, both present and planned.

CHAIRMAN STEIN: Thank you, Mr. Miller.

Mr. Everts, please.

MR. EVERTS: Mr. Chairman, as the Public Health Service reports pointed out, there is certainly a bacterial problem in the river, and I am in agreement with Mr. Miller that the problem needs additional assessment for this reason, that in the Public Health Service's report, they reviewed the water quality objectives which were developed by the Pollution Control Council of the Pacific Northwest basin.

These objectives, as pointed out in our statement yesterday, are long range objectives, which have to be applied with judgment. It seems to me that the Washington State Pollution Control Commission and the Sanitary Authority of the State of Oregon certainly must come to some kind of agreement as to what the standards or bacterial quality of the lower Columbia River should be. At this point, no agreement on that point has been reached. I again refer to the question which was raised in our statement yesterday, that being whether or not the Public

Health Service was ready to recommend that those objectives be applied as bacterial standards for the lower Columbia River.

CHAIRMAN STEIN: Mr. Poston?

MR. POSTON: Well, I will concur that to my satisfaction there has been amply demonstrated that there is a bacterial pollution problem. I am not in full agreement that additional studies are necessary to come up with something that would show some progress in this regard. Perhaps the time has come when we should go into action and forget about so many studies.

I think that we have had evidence presented here that recreational use of the river is not being fully utilized because people just don't like to go into the conditions that are encountered there. I am not in a position to say whether the Public Health Service would endorse officially the recommendations of the Pacific Northwest Pollution Control Council. As you well know, the Public Health Service has some water quality standards, particularly as they apply to drinking water. The matter of getting a finite figure that we can use for some of the other uses is a little bit difficult.

I think we must, as Mr. Everts said, use some judgment and try to achieve as to this problem the earliest possible and best possible bacterial quality of the lower Columbia River.

CHAIRMAN STEIN: I would like to expand this on one more point. I think we have one more thing that I may have omitted when we first began to talk about this bacterial pollution, and that is the use of the river as a potential source of public water supply.

This alludes to the statements made by Dr. Coe, the State Health Officer of the State of Washington, that in his opinion the bacterial contamination of the river, at least in considerable portions of the river, make it unsuitable for a water supply, and that the river would receive serious consideration as a source of public water supply if that were cleared up.

Now, I think Dr. Bucove also indicated in his opinion the water quality of the river in various aspects of it did not make that advisable under present conditions and under present bacterial concentrations. I don't think the parties are too far apart. I think there may be a difference in the question of whether further study or evaluation is necessary, and I think, if both parties mean evaluation of what the possible water quality standards are and if that is an approach to take, then I think we're all pretty close together.

Now, when Mr. Everts asked if we would recommend those, if the Public Health Service would recommend these objectives as water quality standards for the area yesterday, I thought that was a rhetorical question, and, generally, we don't try to answer rhetorical questions, but the question was asked again today, and I think it's certainly our policy and I think one of the requirements of the law, in having worked with Mr. Everts for many years, that at least initially it is the States which should come up with an action program and should develop it, and not actually the Public Health Service.

Our function in this area is to provide technical aid and assistance on request to the States. We would like to work very closely with them on this, but, again, I think in this whole field of water pollution control, we don't want to upset the traditional Federal-State balance and relationships just to deal with the pollution problem. We want to do that within the existing framework of our relationships here, and pollution, as important as it is, and to some of us it's our life work, is certainly not as important as the basic Federal-State relationships.

Mr. Miller.

MR. MILLER: Well, much as I would like to agree with Mr. Poston that we are ready at this moment -- I just judge that's what he meant -- ready now to apply bacterial standards to the river, I know that in our case on the Washington side we don't have the information on which to do that. Certainly, we are not in a position to adopt the broad standards and apply them to all stretches of the river. There are many parts of the river where you would never have recreational use -- take your industrial waterfronts and commercial harbors, and commercial anchorages. Certainly, we can't anticipate that those areas are going to be bathing areas. They're not intended for bathing areas, and no one in their right mind would swim there anyway.

What I'm saying there is that we certainly need the time to go over the river, determine what uses exist where, determine what kind of standards we need to protect those uses, and then go about applying them and enforcing them.

CHAIRMAN STEIN: Do you, Mr. Everts, want to make a further statement, or you, Mr. Wendel?

MR. WENDEL: Speaking from the standpoint of the State of Oregon, which, according to the report, is contributing the greatest bacteriological load on the Columbia River, I would like to say that it's just about a year ago that the city of Portland was ordered to complete its interceptor and treatment plant system. The city has taken cognizance of that through putting on the ballot what they call a package measure, which in one measure includes not only that which they are ordered to do, and that on which they are in violation of law, but also packaged with that a lot of other things, such as parks, and so forth, running to some 30 million dollars, I believe.

When that was proposed, the Sanitary Authority informed the city government that it didn't think it was proper to package all those into one measure on the ballot, and that, regardless of the vote, the Sanitary Authority would use every means at its disposal to see that the city was brought into compliance with State law, and that we propose to do, and since the city of Portland is the chief contributor to the bacterial pollution of the Columbia River, that is the biggest job we have ahead of us, and that which will provide the greatest correction to the Columbia River waters.

The report also mentioned two other cities, St. Helens and Rainier, and both those cities -- one has its work under way now. The other is voting bonds today -- rather, accepting bids for construction today, and that leaves us, as far as the municipalities are concerned, with the city of Portland as the one that will have to be brought into compliance right away. They have been in violation of State order for a great number of years, and we don't propose to let this violation continue.

Now, there's one other thing I'd like to mention while I am, figuratively speaking, on my feet, and that is an article which appeared in one of our papers, which stated that the Sanitary Authority is out of sympathy with the tenor of the hearing, and I want to -- when I read that last night, I then phoned in a correction to the paper and said, "That's not true at all. On the contrary, we feel the hearing will have a very beneficial effect on resolving of interstate problems, bringing to us, as it does, the Public Health Service's nationwide experience in such matters."

The only thing that we could be somewhat disturbed about was the use of the long range objectives, which are not in agreement with standards that have been adopted and which are always open to criticism, discussion and amendment, and I have no doubt that standards must be amended from time to time as the population grows and as industrial developments on the rivers increase, but the long range objectives are at such great variance with standards that have been used, and apparently accepted by everyone because we've been in close touch with Public Health Service people throughout the years, that it came as quite a shock to see what achievements had been made as compared with these long range objectives.

That is the only disagreement that I have on the part of any people connected with the Sanitary Authority, and I just want to set the record straight on that. We are in complete sympathy with this hearing, and we think it's going to help us do our job.

CHAIRMAN STEIN: Are there any further comments on the question?

...There was no response...

CHAIRMAN STEIN: During the recess, we noted that Mr. Wendel had not seen Mr. Schram's exhibit. I wonder, Mr. Schram, if you will get up and pick that net up again for Mr. Wendel's benefit. This net had been in the Columbia River. When was it? Overnight?

...The net was again displayed...

MR. SCHRAM: Two hours.

CHAIRMAN STEIN: Two hours. Yesterday?

MR. SCHRAM: Yesterday.

MR. WENDEL: If that is the result of any conditions due to activities on the Oregon side, I hope you will let us hear from you and give us your complaint.

CHAIRMAN STEIN: The next point we would like to take up is alleged interference with water quality from other sources, and this includes industrial wastes, largely from the statements here pulp and paper wastes, about which it has been stated that they are deleterious to sport and commercial fishing, and also it has been alleged to create a health hazard in creating a dermatitis, and when eyes are rubbed, irritation of the eyes to commercial fishermen.

We know that the paper industry has expended considerable money on research, has put in diffusers operations in an effort to meet the requirements of the Washington agency, and that the slime growth still persists. At least one plant has stated that they have made considerable progress in almost complete elimination of the waste going into the stream.

I wonder if the States would care to comment on that. From our point of view, it seems to be that the industrial discharges here do create a problem in infiltration of these interstate waters and creating conditions causing a degradation of water quality, which is injurious to commercial and sports fishing.

MR. MILLER: There is certainly no question in our minds that a serious problem exists with regard to slimes and sphaerotilus, and that that problem interferes seriously with people who use the river for either commercial or sports fishing, or, for that matter, for some other purposes. I think there is probably no one here who wouldn't agree also that it is an extremely complicated problem, and that there are probably many areas where we don't know the answers. I think this was pointed out very capably yesterday by the representatives of the commercial fishing interests, and I think it's very important that we recognize that this isn't a matter like municipal treatment where you know the specific solution. This isn't an area you can move into without proper information.

This implies more research. I think there needs to be an end to research. I don't think we need to research forever. I think, again so far as the Washington side is concerned, it has to be our objective and our early objective to define what we want and set an objective, and then give industry the job of meeting that objective, of which I am certain they can and they will. This again, however, involves the same problem that I mentioned before, determining where is the problem, to what extent it needs to be reduced to prevent interference.

I'm thinking that there's a possibility that it's physically impossible to prevent every last trace of slime growth. I certainly don't know if this could be done. I wouldn't want to set my mind towards such an objective when I don't know if it can be accomplished. As I say, I think our research or whatever needs to be done in that field has to move forward, has to move forward as expeditiously as possible.

So far as the Washington Commission is concerned, I think we should insist and will insist that it move forward and that we must define the problem that is to be resolved in order that we can expect industry to adopt programs towards solutions.

CHAIRMAN STEIN: Thank you, Mr. Miller.

Mr. Everts?

MR. EVERTS: Mr. Chairman, both the oral and visual evidence, which has been presented at this conference, certainly indicate that the slime in the Columbia River is a real problem, and our Authority certainly stands ready to assist in any way possible in reaching any solution that will correct this problem at the earliest possible time.

CHAIRMAN STEIN: Mr. Poston, do you have anything?

MR. POSTON: I believe I haven't anything further. I agree with the conferees.

CHAIRMAN STEIN: I think we have a substantial area of agreement on that point.

The next point we'd like to consider is adequacy of measures taken toward abatement of pollution. Now, perhaps I might say for the Public Health Service that we may have been a little remiss in preparing out statement and not giving full consideration to all the splendid work which has been done, but the problem we face is this: It is sort of taken for granted that the industries and the municipalities living in this area face up to their problem and do something to protect their resource, and then we also have the problem that the Public Health Service -- when you get down to any individual agency, you know you have people out here that might think it's a very rich Federal Government -- has a limited budget. We, in a sense, operate very, very tightly, and, when we send an investigator out, we are spending the taxpayers' money, your money and our money, and we try to present and get the man to do a minimum amount of work just to accomplish the purposes that we're trying to follow. These purposes here are to ascertain whether interstate pollution exists and are subject to jurisdiction of the Federal Act.

To try to determine the adequacy of the measures generally on that, we have relied upon the State agencies, the industries and the municipalities involved, and I think that's how it's worked out here. These groups have given us a pretty clear picture of the work they have done, and the accomplishments which they have made. I think the record will clearly indicate that, and I think the method of procedure that we have spelled out is probably justified, but I would like again the States perhaps to review the adequacy of measures which have been taken.

I think it has been pretty well agreed that, while considerable progress has been made, we still do have a problem of bacterial contamination and pollution due to industrial created slimes which create conditions injurious to commercial and sport fishermen, but to talk about the measures which have been taken, I'd like to call on Mr. Miller.

MR. MILLER: We've talked a lot about progress, and there has been a lot of progress. I just want to say that I can certainly understand, from the standpoint of the person who uses the river, that, to just take my own situation, if I had to handle the little exhibit in the basket very often, I would probably be very difficult to convince that there's been a lot of progress, but I think we must look at the record.

On the Washington side, if my memory serves me right, there are two cities -- they're small cities -- that have no sewage treatment facilities at the present time. There has been substantial activity and progress on the industrial front also.

I think we must recognize that the problems that are bothering us now are bothering us because they are the most difficult ones to solve, and, as I indicated before, because they are complicated, they take time.

I think it might be interesting at the conclusion of this conference to put a dollar value on these improvements that have been made in the pollution control field, on the sewage treatment plants that have been constructed, and on the various activities that have been conducted by business or by industry. I think that probably the total dollar value would be pretty impressive to all of us, and we all know where the money has to come from. Our difficulty is to raise it. I think that's a real achievement.

CHAIRMAN STEIN: Thank you, Mr. Miller.

Before I turn this over to Mr. Everts, I want to emphasize and underline one part of what Mr. Miller stated, and that is that this is a complex and tough problem. We're dealing with a hard problem. This is one thing I hope everyone will go away with. Generally, when the Public Health Service comes into an interstate pollution problem of this sort, it is a tough problem, and it is a hard one. It is a complex problem because, if that were not the case, we would not be here. Certainly, in that case, we would not be coming out.

Mr. Everts?

MR. EVERTS: Mr. Chairman, in the statement which Mr. Wendel presented to this conference yesterday, the accomplishments, which have been made to date in Oregon, were included in the Appendix. I believe that I can summarize those briefly by saying that all of the domestic sewage originating on the Oregon side of the river now has or is now provided with treatment before discharge into that stream, except for the city of St. Helens and the city of Rainier.

Mr. Wendel has pointed out this morning in his comments that the city of St. Helens now has a treatment plant now under construction at the present time. The city of Rainier received bids yesterday for the construction of a treatment plant for that city. With the completion of those two installations, the domestic wastes from those cities using the lower Columbia River as a point of discharge will be completed.

On the other hand, the city of Portland still has work to do to remove the discharge of untreated sewage from the Willamette River. When that project is completed, we will certainly expect improvements to be made in that area. There still remains the problem of chlorination of Portland sewage, and that will be a subject of discussion between the Sanitary Authority and the city of Portland another day.

CHAIRMAN STEIN: Mr. Poston?

MR. POSTON: I wish to commend the official agencies of Washington and Oregon for their past efforts and to recognize the tremendous expense the industries and municipalities have been put to in their efforts to abate pollution.

CHAIRMAN STEIN: Thank you, Mr. Poston.

The next point we would like to discuss is the nature of delays, if any, being encountered in abating pollution, and I think we can say that the conference discussions have indicated what some of these areas might be.

I think Mr. Wendel pointed out here that the city of Portland has been under orders and has now taken action as far as municipal pollution is concerned, and I think, if the city of Vancouver chlorination process is not sufficient -- and I am not prepared to say that it is or it isn't -- but Mr. Kittrell's report raised the question in the evaluation, and I can understand the reluctance of people in a smaller community taking action, and not waiting until their larger sisters here in Portland have taken action, at least commensurate action. This is a kind of problem, I think, that is not for the communities in this area, but it is the type of problem we find in any large stream, and particularly interstate streams, where much of municipal action is dependent upon the large city in the area, showing the way, and then the other cities put in like treatment and take like action.

Now, I would point out that there is a little different situation with these municipal wastes because I don't think there is very much doubt that there are known available methods of dealing with the municipal wastes which come from Vancouver and Portland and the other municipalities here. The nature of the delays as far as industry may be concerned is a question of finding an equitable and economical solution, or any solution from industry's point of view in pollution control, and perhaps a feeling by industry, as indicated in some statements here, is that the water users interfered with were relatively minimal and didn't require the expenditure of funds to provide the kind of treatment.

Now, these are problems I think which have to be met squarely if a legitimate and substantial water use is interfered with, and the equities of the situation demand that the person contributing to that pollution stop interfering with that water use, stop discharging so that the water quality will improve.

I think it is well established by Federal Law and all State Laws that I know of that the persons responsible for the discharge, whether they be a municipality or an industry, have the responsibility for taking care of their own wastes. This means providing adequate treatment facilities to take care of the wastes, and also devising methods of treating that waste. The devising of methods of treating the waste is not the responsibility of a Federal or State regulatory agency or commission, however constituted, and I do not think that industry or the municipalities would want that. It's very clear in the law of the land that it is the responsibility of the municipalities and industries to devise their own methods, and I think the demands of the American people for water of a reasonable quality is such that within a reasonable time it behooves all water users to accommodate the others and cooperate in a program of water quality management so that an area control can accommodate industry, expansion of industry, and expansion of population, and yet make the water available for other legitimate uses.

In this area, one of the major uses of the water seems to be commercial fishing and recreation, and, of course, in addition to that, as the pressure of population becomes more and more apparent to this area, the folks here are going to be looking to the Columbia River as a potential source of public water supply.

I might add on the side here, before we turn this over, that in Washington at the present time we are involved in a tremendous operation in trying to preserve the nation's water resources. One of the big problems we have here is the operations with Canada on keeping water in the Columbia River sufficient, not perhaps in conjunction with their plans that they have set up in the Fraser River. Now, we keep pointing out over and over again to the people here to keep this in mind, that just getting the quantity of water, a sufficient quantity of water is not enough unless we have adequate water quality management and are making good use of that water. Our position becomes emaciated when we try to get and preserve an adequate quantity of water down that stream if we're going to dissipate the use of that water when we finally get it.

With that, I would like to turn over -- well, there is one more point that I think we should emphasize. To pick up Mr. Miller's point, Mr. Miller stated in his original prepared statement that the State agencies of Washington and Oregon should get together to work out a concerted program towards this problem. I think we might indicate that that is a third area of the nature of delays in this problem because I think that any of these interstate problems, where we're not just dealing with one side of the river or the other, we do know that we have two able Commissions, and that the problem of interstate relationships between two States is always a delicate one and a difficult one, but I'm sure these folks can do it, and the solution of the problem, it seems to me from the statements made at the conference, is for the State agencies of Washington and Oregon to come up with a joint concerted program so that the river problems and action to handle these problems can be evaluated on a total basis.

Mr. Miller?

MR. MILLER: Are you talking on the nature of delays?

CHAIRMAN STEIN: The nature of delays.

MR. MILLER: Well, on the municipal side of the picture on the Washington side, I don't think it's really necessary to talk about the nature of delays. As indicated before, we have just a few small towns left, and it's just a matter of getting the city fathers to convince their citizens to vote the necessary bonds to put in these systems. I think they should be encouraged, and I'm sure that our Commission will, as it has in the past, as measured by the accomplishments, encourage these people to move forward as quickly as possible, and I don't anticipate any delay in that way that will affect the full Columbia picture on the municipal side.

On the industrial side of it and in general for the moment, I would like to feel that the -- or I do feel that the main delay is lack of knowledge. As I said before, we need to acquire this knowledge as quickly as we can. From the standpoint of the official agency, I think we need to move rapidly into seeing that we set our objectives so that industries and municipalities will know clearly and definitely what we want, what we will insist on, and what will have to be done.

I just want to comment, since the Chairman mentioned the joint meeting that we recommended with Oregon under the subject "nature of delays", that I don't want the inference or the impression taken away that there has been any reluctance on the part of either the Oregon or the Washington authorities to get together. In fact, they have gotten together once, I think. That's a good start. I think we will probably do that again soon. Certainly, there hasn't been any delay in this field, because we haven't gotten together, we just haven't done it.

CHAIRMAN STEIN: Thank you, Mr. Miller.

Mr. Everts?

MR. EVERTS: Mr. Chairman, I don't believe that we have any further comments on that subject, other than we agree with Mr. Miller.

CHAIRMAN STEIN: Mr. Poston?

MR. POSTON: Within the limits of our resources, the Public Health Service will assist in any way with problems that we're called upon to help these two pollution control commissions to solve.

CHAIRMAN STEIN: Then we come now to one final point in these discussions and the conclusions, which we seem to be doing together, and that is, where do we go from here. I think, as far as I'm concerned, this has been a most enlightening experience in beginning to develop a factual basis for this problem.

I might go back and give you a personal experience in Washington -- that is, Washington, D. C. We have been hearing about the lower Columbia River for many, many years. They have been exaggerated statements, and, by the time they get to Washington, they get so magnified that the area seems to be exaggerated. The statements did not determine what the situation was.

We've tried to evaluate the situation as part of our normal activities under the Water Pollution Control Act, and we found that on examination of the literature and statements it was so complicated and there were so many unresolved areas, we just couldn't come up with a definitive judgment, although it seemed that it was very clear that there was an interstate pollution problem here and there seemed to be sufficient evidence to indicate that. Then Mr. Kittrell came out and I think he did a magnificent job in the short period that he was here in cooperation with the States, industries and municipalities involved. Then the picture began to get a little clearer.

Now, as a result of this conference, and getting all these reports together, I think we have a pretty clear picture of what is happening in the Columbia. Now, perhaps you folks, who have lived here, have been aware of this problem and know the scope of the problem and have known it for a long time and have known just what it was. I, for one, have seen this evolve from a misty problem that we just couldn't put our finger on to handle all the aspects of it, and I've seen it sharply developed here.

I would suspect from talking to many people here that in a measure this conference has been useful to the people working in the field here and the residents in the area in helping develop the problem for them too, and, hopefully, I think, once we have the problem set out before us, we have to come up with a -- we don't want to let this hang here -- we have to come up with or try to come up with a solution.

I would like to point out a provision of our law that says that, if the Surgeon General believes upon conclusion of the conference or thereafter that effective progress toward abatement of pollution has not been made, he is to recommend that the State agencies take appropriate remedial action.

Well, I don't know, unless we set up an actual kind of program, whether the Surgeon General -- he has to make a judgment on this -- will be able to make the judgment. What I would like to do is to take back to the Surgeon General of the Public Health Service a definite action program, to be able to tell him that in our opinion that effective progress toward abatement of pollution in this area, or the meeting of the pollution problem, is being made, and, toward that, I would suggest that we might consider as a proposal one of the alternatives I mentioned in the opening statement of the conference, and that was that we consider this session of the conference the first session of the conference, and that the State agencies be charged to follow the suggestion made by Mr. Miller of getting together as rapidly as possible after the conclusion of the conference and working out a joint action program for the lower Columbia River, which will include an evaluation of the uses of the river, the problem of bacterial contamination, the problem caused by industrial discharges, slime growths, the effect on commercial and sport fishing, and, briefly in a sense considering that, what the States would want to be done in order to come up with and achieve water quality which they believe could be reasonable to secure and equitable under the circumstances, and to decide when that was going to be done, so the industries and municipalities would have to meet their obligations if they had to do anything.

Now, we would want to set a particular time for this to happen, that is, until the second session is called. Also, we would like to, as we have done in other conferences -- and this is acceptable -- to have the Public Health Service, and that would be Mr. Leonard Dworsky, who is coming into this area as our representative with offices in Portland, to make a periodic progress report at certain intervals, based on information he's gotten from the States for distribution to the conferees and the State agencies, and for distribution to any people they may want to distribute it to.

Now, maybe we can switch the procedure and call on Mr. Everts first.

MR. EVERTS: I haven't finished my discussion with Mr. Wendel.

CHAIRMAN STEIN: Mr. Miller?

MR. MILLER: Generally, we agree with that line. I would like to suggest that the conferees should get together at three or four or six month intervals to discuss progress at check points and see where we are headed, and probably use those meetings for a determination as to whether or not a further full-blown conference is needed and when it might be needed.

CHAIRMAN STEIN: Well, we would agree with that. The problem we have here, as you know, is that we have a conference under way, and we would like to get a terminal point on the conference. Now, I would not visualize that we would need a full-blown conference. It may well be that, if an actual program is developed, we may be able to have a second session where an announcement would be made of the determination of the actual program, without getting statements or participation as we've had here today, because I imagine in the development of your action program, you are going to have similar discussions, at least analogous discussions with the people in your area.

We would not visualize that, but just as a touch point to get us together so we can have a termination point. I don't think we can determine that termination point at this stage.

Mr. Wendel?

MR. WENDEL: Mr. Chairman, it would seem that what the two States could do jointly is chiefly agreement and establishment of standards, to which they both will subscribe. Thereafter, our problems seem to be mainly individual problems. We have the problem on the Oregon side of bacteria mainly, on the Washington side an industrial problem, and I think that is going to require each one of us to do an individual job on the problems that we have, and I think the States jointly would establish panels. Am I correct in that?

CHAIRMAN STEIN: That is correct, but I would like to make one point there, and that is on what we at least have in mind by a joint program, because, while your problems may be different, yours bacterial and Washington's industrial, largely speaking, the effects are mutual. In other words, it would not be appropriate for you folks to come up with certain bacterial requirements or provisions which would not be satisfactory to the Washington people. In the same sense, it would not be appropriate for the Washington people to come up with certain requirements for the industries, which, even before their inception, would not be satisfactory to you.

That's part of the problem. We visualize that, once these are set, you people will, of course, have your individual programs. What I would like to do, if we could, is to not leave this indefinite as to when we would try to get together again for the second session, so that we could have a time and a date that we could bring back as a check point.

Now, I wonder if any of the conferees might have a suggestion as to how long you might think this process would take. Let me make this clear. I'm not talking about a completed process of total improvement. I'm talking about the process of getting together where we can have an action program at the second session of the conference and then terminate it as a Public Health Service conference.

MR. MILLER: Well, it certainly is most difficult to sit here at this moment and try to guess when we might be able to develop this program. I think, as I said before, it ought to come off as quickly as possible. I think that one thing we should avoid is that, if we set a time limit, say a year, and we find that in six months we're ready to proceed, we shouldn't use the year to just use up the time because we had set a date, and I think that's one of the disadvantages of setting an exact date.

However, if the law requires an exact date, I will suggest as a starting point a maximum of one year.

CHAIRMAN STEIN: I would agree. Let me clarify a point on that. The question we have here -- we can formulate this for not longer than a year, but, if the conferees believe that they're ready, we will be here as soon as practical before the year. The difficulty in not setting a date, and this I'm projecting from past experience, the difficulty in not setting a date is that very often, when this happens, some people say that the State or we or someone is taking an unreasonable or an inordinate amount of time. Now, the question of reasonableness or reasonable time varies with every individual that I have ever confronted.

We have found that for orderly procedure for both State activities and our activities and the activities of the persons responsible for the sources of discharges and persons using the river it is always best for them to have a date certain so we all know what we're talking about, and we can concentrate on that issue, rather than on the question of who is reasonable and who isn't, and that's the only reason for suggesting a date. Perhaps a year, which is your suggestion, or before that, if practical and if requested to do so, would be suitable for the conferees.

MR. EVERTS: Mr. Chairman, I'm certainly sympathetic with Mr. Miller's opinion on this matter with this exception, that I'm quite confident that under the laws both States are

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bound to do just as much as they possibly can within their area in administering their own water pollution control statutes, and I'm also extremely confident that the Sanitary Authority is not going to wait until a year to move in on some of these situations.

I would like to suggest that, while you may wish to set a year as a date for a subsequent continuation of this conference -- that's my understanding of what you're suggesting -- that perhaps the conferees themselves could meet in an interim period of six months, or perhaps earlier, if problems developed or if matters were such that it would seem appropriate, so we might have an opportunity to discuss where we were headed, how much progress had been made, what further might need to be done, and not wait until the end of the year for the continuation of the conference, if that suggestion might be agreeable with my colleagues from Washington. I'm sure it's agreeable with the Sanitary Authority. I make that suggestion.

MR. WENDEL: With one exception. Insofar as the city of Portland is concerned, they've been on notice now for some time, and we are considering calling a meeting very, very soon, a special meeting of the Sanitary Authority, and, if I can presume to anticipate the reaction of the Sanitary Authority, I would guess the Sanitary Authority would give the city of Portland three months in which to develop a financial program and the adoption of an immediate action on that program that will lead to compliance with State law.

I'd like to ask Mr. Everts if he doesn't feel that from past experience with the Sanitary Authority that that will be their action.

MR. EVERTS: I would certainly concur in that. There would probably be 90 days and he said three months. So, that will give them one or two days more.

CHAIRMAN STEIN: Mr. Poston?

MR. POSTON: I think these are reasonable suggestions that the conferees have agreed to. I believe that it's quite a practical solution to the problems which we are faced with here today. I would like to make their thoughts or ideas unanimous.

CHAIRMAN STEIN: Thank you, sir, and I would like to again suggest that what we have done in other conferences that we've conducted and that we do at these interim meetings, and that is have progress reports at periodic times, and I would suggest that the Public Health Service representative prepare such periodic reports. This is something that we would need, to prepare progress reports at intervals not longer than every three months.

Now, I would like to say, before we summarize, that this has been very productive, and I would like to give the States an opportunity to make any final statement they wish to make.

Mr. Miller?

MR. MILLER: We want to certainly express complete, one hundred percent agreement with Mr. Wendel's statement as made earlier, and that we feel this conference has been most helpful and most productive. We've learned a great deal and have a great deal of evidence and information that we didn't have before.

I think that one thing has come out here that should be of interest to the general public, and that is that there is no fundamental difference of opinion whatsoever between the authorities in the State of Oregon and the authorities in the State of Washington. I think that's a very good place to start from. I'm certain that we can meet on common grounds and adopt common objectives of mutual benefit to the States. I think the participation and offers of assistance from other agencies, both State and particularly Federal agencies, that have been made here at the conference, are most encouraging because a lot of these problems involve the total problem of water management, and the assistance of Federal agencies and State agencies for that part of the picture is going to be extremely beneficial.

CHAIRMAN STEIN: Thank you, sir.

Mr. Everts, do you want to make a concluding statement?

MR. EVERTS: We certainly appreciate the cooperation and the assistance of the Public Health Service in dealing with this problem, and the Sanitary Authority of the State of Oregon certainly has every confidence in the cooperation of the two States to bring about and maintain the desired results.

Do you have any more comments?

MR. WENDEL: No.

CHAIRMAN STEIN: I'd like to say that on the basis of the national viewpoint we believe that both States will have excellent and dedicated men and active programs to meet these problems. As a matter of fact, I hope the repercussions of this won't be too much in other States. I think that the programs and the attitudes and competency of the staffs that you have in both State agencies are among the best in the United States, and I think that is something that you should be proud of and recognize as a tremendous resource here in this area. I might say that goes for the folks who are working very closely with us in the State health departments too.

In order to summarize the conference, I think the conferees have agreed that there are problems of pollution of interstate waters in the lower Columbia River, which need a further evaluation and development of an action program by the State agencies to meet; that these problems consist of bacterial contamination associated with the discharge of untreated or inadequately treated sewage, mixed with incidental wastes from these communities, which contain coliform organisms and which is associated with disease transmitted which today is a potential hazard or may create a potential hazard to recreation, boating, swimming, water skiing, fishing, trapping, water fowl hunting, and other waterfront activities; that this also results in a deterioration of the quality of the waters of the lower Columbia River so as to interfere with its use as a potential public water supply; that discharges from industries in the lower Columbia River, notably pulp and paper industries, have caused the growth of slimes, nominally sphaerotilus, which cause conditions which are deleterious to commercial and sport fishing, and to persons engaged in these activities.

The conference takes full cognizance of the progress made to date by both municipalities and the industries in trying to meet the problem. In its recognition of the large research program engaged in by the industries, it takes cognizance of the fact that the industries have spent substantial amounts of money putting in measures to achieve remedial action at the request or suggestion of State agencies.

Also, the conference recognizes that slime growths still do occur in the river, and that these create a deleterious condition to commercial and sport fishing. The conference believes that, while taking cognizance of this or of these measures, it should also point out that the measures taken to date have not been completely adequate to control bacterial contamination in the river and to control industrial discharges in amounts which affect and cause the slime growths to be there.

The conferees agree that the nature of delays has been due to the fact that the municipalities have not taken action in some cases to install known remedial measures, but the conferees also take cognizance of the fact that many municipalities have constructed or are now in the process of constructing adequate treatment facilities.

The conferees take cognizance of the fact that industrial wastes are still causing a slime growth problem in the stream, and that these delays may be due to a lack of an evaluation of stream conditions which are necessary to stop the slime growths and possibly a method of treating these wastes.

The conferees, I think, also believe that joint action by both State agencies is necessary as a prerequisite of determining the quality of water considered desirable for the lower Columbia River and for the people of this area.

The conferees agree that, as soon as practical after the conclusion of this conference, both official State agencies of the State of Oregon and the State of Washington will take joint action to determine an action program to provide an adequate water quality management program in the lower Columbia River. This joint action program will include the quality of water that is considered to be needed for legitimate water uses, what is to be done to get the river clean, and when this action is to be taken. I think the conferees agree that this will be considered as the first session of the conference, and the second session to be called not more than one year from now, but as soon as practicable after this joint action program has been developed, to review the program and to evaluate it and come up with definitive recommendations by the conferees.

The conferees also agree that the representatives of both States and the Public Health Service will make themselves available for interim meetings in the development of this joint action program at a frequency considered desirable in order to develop this program. The conferees also agree that the Public Health Service will prepare progress reports concerning the development of this joint program at intervals of not to exceed three months, but as often as required to record significant developments and reports of meetings which have been held.

Are there any suggestions, corrections or amendments to the statement that I made?

MR. MILLER: I have none.

CHAIRMAN STEIN: Mr. Everts?

MR. EVERTS: No.

CHAIRMAN STEIN: Well, if not, I would like to say that we've appreciated all of you coming, your patience, your participation in this meeting. We of the Public Health Service have learned a lot, and I know perhaps you possibly have learned a little bit about how we work too, and with that -- I'm not saying adjourned -- we will recess the first session of the conference until the second session is called.

...Whereupon, the First Session of the Conference was recessed at 12:10 o'clock, p.m., Thursday, September 11, 1958, sine die...

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...Because it is felt that it will be of interest to those concerned, there is quoted below a letter received by the Portland office of the Public Health Service on August 18, 1958, from William A. Pearl, Administrator, Bonneville Power Administration, Portland, Oregon...

"I appreciate your invitation to the conference on pollution of the lower Columbia River because of my work on air and water pollution problems when I headed the Institute of Technology at Washington State College. Here at Bonneville Power Administration, however, we are not directly involved with pollution. We do have a section on the subject in the standard provisions which we attach to our industrial power contracts which may be of interest to you. This provision reads as follows:

> "15. Conservation of Natural Resources. The Government will not be obligated to deliver power pursuant to this contract whenever, in the judgment of the Administrator, the Purchaser's plants or operations would harm or detract from the scenic beauties of the Columbia River Gorge, or the waste products from such plants or operations would harm or destroy the fish or other aquatic life, or otherwise pollute the waters of drainage basins of the Pacific Northwest.

"No problems have arisen under this contract provision, and so far we foresee none at the present time.

"Accordingly, I will not plan to make any statement at the conference although I shall try to attend."

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Appendix A

ATTENDANCE ROSTER

CONFERENCE ON INTERSTATE POLLUTION

Portland, Oregon
September 10-11, 1958

Amberg, Herman R.	Research Specialist, Crown Zellerbach, Camas, Wash.
Anders, Floyd S.	Fishery Management Biologist, U. S. Fish & Wildlife Service, Portland, Ore.
Arntz, William C.	Budget Examiner, U.S. Bureau of Budget Washington, D.C.
Bacon, Vinton W.	Exec. Secretary, Northwest Pulp & Paper Assoc., Tacoma, Wash.
Baker, Raymond E.	Mgr. of Mfg. Pulp Division, Weyerhaeuser Timber Co., Tacoma, Wash.
Barnes, Francis M.	Asst. Secretary, Crown Zellerbach Corp., Camas, Wash.
Barber, Lawrence	Marine Editor, Oregonian, Portland, Ore
Beatty, R. O.	Western Kraft Corp., Portland, Ore.
Benson, Donald J.	Assoc. Sanitary Engr., Ore. State Sanitary Authority, Portland, Ore.
Blackerby, L. H.	Western Editor, Pulp & Paper, Portland, Oregon.
Blankenship, Chas. F.	M. D. Regional Medical Director, USPHS, San Francisco, Calif.
Bowman, Quentin	Field Representative, Water Resources Board, Salem, Oregon
Boylon, F. O.	Resident Mgr., Crown Zellerbach, Camas, Washington
Bresee, H. O.	Regional Vice Pres., Oregon Wildlife Federation, Portland, Oregon
Bucove, Bernard	M. D. Director State Dept. of Health, Olympia, Wash.

Burt, Gordon L.	City Engr.. Portland City Hall, Portland, Ore.
Bullard, William E.	Forester, U.S. Forest Service, Portland, Ore.
Busby, Ronald R.	Crown Zellerbach, Camas, Wash.
Carter, Glen D.	Aquatic Biologist, Ore. State San. Auth., Portland, Ore.
Cellars, James H.	Exec. Sec., Columbia River Salmon & Tuna Packers Assoc., Astoria, Ore.
Charlton, Dave B.	Charlton Laboratories, Portland, Ore.
Childs, Rex	Pacific Bldg. Materials Co., Portland, Ore.
Clare, Herbert C.	Officer in Charge, USPHS, WS&WPC Activities, PNW, Portland, Ore.
Coe, Earl	Chairman, Wash. Pollution Control Commission, Olympia, Wash.
Crown, Arnold W.	Chemist, Reynolds Metals Co., Troutdale, Ore.
Cuyler, Clarence E.	Assoc. Sanitary Engr., Ore. State Sanitary Authority, Portland, Ore.
DeCoss, Gordon	Ind. Field Rep., Ore. State Dept. Planning & Dev., Portland, Ore.
Dunlap, R. C.	Parks Planner, Ore. State Parks, Salem, Ore.
Dupuis, R. A.	Res. Mgr., Crown Zellerbach, St. Helens, Ore.
Dworsky, Leonard B.	Sanitary Engr. Dir., USPHS, Kansas City, Mo.
Eldridge, Edward F.	Physical Science Admin., USPHS, Portland, Ore.
Elliot, A. S.	Cdr., U.S. Coast Guard, Portland, Ore.

Everts, Curtiss M. Jr.	Sec., Ore. State San. Authority, Portland, Ore.
Fisk, Garry L.	SA San. Engr., USPHS, Portland, Ore.
Gellman, Isaiah	Reg.Engr., National Council for Stream Improvement, Portland, Ore.
Gibbs, Charles V.	Pollution Control Engr., Wash. Pollution Control Comm., Olympia, Wash.
Gleason, R. J.	Dist. San. Engr., District Public Works Office, Navy Dept., Naval Station, Seattle, Wash.
Harris, Robert R.	Chief Construction Grants, USPHS, Washington, D.C.
Hirschborn, George	Aquatic Biologist, Ore. Fish Commission, Clackamas, Ore.
Holland, Gilbert A.	Biologist, Wash. Dept.of Fish, Seattle, Wash.
Howard, Mark	Health Info. Cons., State Board of Health, Portland, Ore.
Huff, Don H.	Chairman PNW Field Com., Dept.of Interior, Portland, Ore.
Inman, Lloyd	Water & Sewer Superintendent, Longview, Wash.
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